U.S. Army Garrison Alaska

Draft Environmental Impact Statement Addressing Heat and Electrical Upgrades at Fort Wainwright, Alaska

June 2020

Draft

Environmental Impact Statement

Addressing Heat and Electrical Upgrades at

Fort Wainwright, Alaska

June 2020

APPROVED BY:

Christopher J. Ruga
Colonel, U.S. Army
Commanding

18 JUN 20
Date

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To the Reader:

Thank you for your interest in the U.S. Army Garrison (USAG) Alaska Draft Environmental Impact Statement (EIS) Addressing Heat and Electrical Upgrades at Fort Wainwright, Alaska. Federal, state, and local agencies; Alaskan Native tribal governments and organizations; and the public are invited to participate and comment on the Draft EIS. The USAG Alaska plans to hold a web-based online open house in fall 2020 to provide information on the Draft EIS and to provide an opportunity for public input in a telephonic public forum. The Army will publish a series of notices in local newspapers and on digital platforms to announce the date and time of the web-based online open house and telephonic public forum.

The U.S. Environmental Protection Agency published an announcement of receipt of the Notice of Availability for this Draft EIS in the *Federal Register*. Within the *Federal Register* there is also a Notice of Availability from the U.S. Army, which provides summary information about the Draft EIS. The U.S. Army is seeking comments for 60 days following the *Federal Register* publication. The Draft EIS is available for public review at the Noel Wien Library in Fairbanks, Alaska, the Fort Wainwright Post Library, and the Tri-Valley Community Library in Healy, Alaska, if these facilities are open. Additionally, an electronic copy of the Draft EIS is available online at: https://home.army.mil/alaska/index.php/fort-wainwright/NEPA/HEU-EIS.

Written comments on the Draft EIS and request for additional copies of the Draft EIS should be forwarded to:

Direct Mail:

Ms. Laura Sample
NEPA Program Manager
Directorate of Public Works
Attn: IMFW-PWE (L. Sample)
1046 Marks Road #4500
Fort Wainwright, AK 99703-4500

Telephone: (907) 361-6323

Email: usarmy.wainwright.id-pacific.mbx.heu-eis@mail.mil

For Further Information:

Please contact Mr. Grant Sattler, Public Affairs Office (PAO), IMPC-FWA-PAO (Sattler), 1060 Gaffney Road #5900, Fort Wainwright, Alaska 99703-5900; telephone: (907) 353-6701, email: alan.g.sattler.civ@mail.mil

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DRAFT ENVIRONMENTAL IMPACT STATEMENT
ADDRESSING HEAT AND ELECTRICAL UPGRADES AT
FORT WAINWRIGHT, ALASKA

Lead/Responsible Agency:	United States Army Installation Management Command
Title of the Proposed Action:	Heat and Electrical Upgrades at Fort Wainwright, Alaska
Designation:	Draft Environmental Impact Statement
Prepared by:	U.S. Army Garrison (USAG) Alaska

Abstract:
USAG Alaska is proposing to upgrade its central heat and power plant (CHPP). The Draft Environmental Impact Statement (EIS) three action alternatives: Alternative 1, Build a New Coal-Fired CHPP; Alternative 2, Build New Dual-Fuel Combustion Turbine Generator CHPP; and Alternative 3, Install Distributed Natural Gas Boilers. None of the action alternatives would result in significant adverse impacts on environmental resources. Alternatives 2 and 3, however, would have significant localized adverse socioeconomic impacts.

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Executive Summary

Introduction and Background

This Draft Environmental Impact Statement (EIS) addresses the proposal by the U.S. Army Garrison (USAG) Alaska for implementation of heat and electrical generation and distribution upgrades at Fort Wainwright, Alaska. Fort Wainwright is located in the interior of Alaska, adjacent to Fairbanks, and is home to USAG Alaska and units of U.S. Army Alaska (USARAK), including the 1st Stryker Brigade Combat Team, USARAK Aviation Task Force, and Medical Department Activity-Alaska. To support the readiness of these U.S. Department of the Army (Army) forces, USAG Alaska is dependent on reliable heat and power supplied to more than 400 facilities across the 9 million-square-foot installation. The installation generates all of its own heat and most of its electricity by burning coal at a central heat and power plant (CHPP) under a utility privatization contract with the System Owner; the remainder of electricity required for the installation is obtained directly from a local utility provider.

The CHPP has been in use since 1955, is one of the oldest operational coal-fired power plants in the United States, and is operating approximately 30 years beyond the average design life of similar facilities (U.S. Army Corps of Engineers [USACE] 2012, 2018; SourceWatch 2017). The installation's steam utilidor distribution system for transferring heat throughout the installation is also operating at or beyond its design life (Guernsey 2015). In the last decade, the CHPP has experienced four separate near-catastrophic failures, each of which halted the plant's ability to generate electricity and provide steam to the North Post area of the installation and required several weeks to fully repair. Additionally, a coal-dust fire that occurred in the CHPP's South Coal Tower in 2018 resulted in limited operations while the facility was repaired. Continued investments in this nearly 65-year-old, operationally inefficient plant would be a risk because it is unknown whether the plant would continue to reliably sustain the mission or whether continued operation of the antiquated system would result in a large plant failure of critical infrastructure (USACE 2018). The loss of the CHPP's ability to generate heat and power on the installation would be considered a catastrophic event that would require immediate actions to evacuate the installation.

In addition to the existing operational deficiencies, the CHPP has periodically failed to meet state and federal air emissions standards. In 2017, the U.S. Environmental Protection Agency (EPA) designated the Fairbanks North Star Borough, which encompasses Fort Wainwright, as a serious nonattainment area for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). To meet statutory limits for $PM_{2.5}$, USAG Alaska is required to implement Best Available Control Technology (BACT) at the heat and power plant (implementation costs estimated between $22 million and $235 million (ADEC 2019a; Agrawal 2020). In January 2018, the Alaska Department of Environmental Conservation (ADEC) issued a notice of violation to the CHPP's System Owner for exceeding statutory carbon monoxide (CO) emission limits. To meet the statutory CO limits and comply with the federal emissions standards, the CHPP boilers are currently operating at 20 percent reduced capacity. Operating the installation heat system at 42 percent efficiency further increases the existing fiscal and operational constraints on the USAG Alaska mission (Guernsey 2015).

Summary of Proposed Action

USAG Alaska is proposing to upgrade its heat and electrical generation and distribution capabilities for safety and energy reliability purposes. To adequately heat and provide power to installation facilities year-round and ensure sustained operational readiness and mission security into the future, USAG Alaska determined that the Proposed Action would need to generate 1.3 trillion British thermal units (Btu) annually, which is equivalent to an annual average of 45 megawatts, of electric capacity. (This document frequently references million British thermal units [MMBtu]. A trillion Btu is equivalent to 1 million MMBtu.)

Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to provide reliable heat and electrical infrastructure for Fort Wainwright that resolves current safety, resiliency, fiscal, and regulatory concerns. The Army's current target, contingent upon available funds, would be to implement the project by approximately 2026.

USAG Alaska needs reliable, economically and environmentally efficient, and operationally sustainable heat and electrical infrastructure for the installation. Fort Wainwright's existing coal-fired CHPP and distribution systems are operating at approximately 42 percent efficiency, are beyond their design life, and are nearing the end of their useful lives (Guernsey 2015). Because of the continued reliance upon antiquated technologies for installation heat, Fort Wainwright has one of the highest heating costs of any installation in the Army (USACE 2018). USAG Alaska needs to construct reliable heat and electrical infrastructure on the installation for the following reasons:

- The existing CHPP and distribution systems present a major energy safety and security risk from the potential of a single-point catastrophic failure, which may require evacuation of the installation and severely affect mission readiness.
- Fort Wainwright is mandated by Army and Department of Defense regulations to meet energy efficiency and energy security requirements.
- The installation needs to reduce emissions associated with criteria air pollutants to help meet air quality regulations.
- The installation needs to meet energy security and resilience criteria and maintain backup capacity.

Scope of the Environmental Impact Statement

The Draft EIS evaluates the potential direct, indirect, and cumulative impacts associated with implementing reasonable alternatives of the Proposed Action as well as a No Action Alternative. This Draft EIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [U.S.C.]

4321 *et seq.*); NEPA-implementing regulations issued by the President's Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the Army's NEPA-implementing regulation (32 CFR §§ 651.1–651.53, Environmental Analysis of Army Actions).

USAG Alaska has prepared this Draft EIS to inform decision-makers, the public, Alaska Native tribal governments, regulatory agencies, and other interested parties about the potential adverse and beneficial environmental impacts of implementing the Proposed Action. This Draft EIS was filed with the EPA to announce the availability of the Draft EIS in the *Federal Register.* The Army also published a Notice of Availability (NOA) for the Army that provides summary information about the Draft EIS. Publication of the NOA in the *Federal Register* began the start of a 60-day comment period. USAG Alaska has not yet selected a preferred alternative for the Proposed Action. The Army will fully consider comments received on the Draft EIS prior to determining a preferred alternative. The selected alternative will take into account technical and economic feasibility, environmental and social issues, and the ability to meet USAG Alaska and USARAK mission objectives. The Final EIS will also address and respond to substantive comments received on the Draft EIS, be signed by the USAG Alaska Garrison Commander, and be released to the public for a 30-day period. The final decision and rationale for selection of an alternative will be presented in the Record of Decision for the EIS, which will be signed by the Executive Deputy to the Commanding General, U.S. Army Installation Management Command.

Alternatives Considered

Through the NEPA process, alternatives for implementing the Proposed Action are developed and analyzed to provide decision makers with options as well as an understanding of how the Proposed Action may affect various resources. Alternatives carried forward for full analysis in the EIS must be reasonable and meet the purpose of and need for the Proposed Action.

The Army considered a wide range of potential alternatives to upgrade heat and electrical generation capabilities at Fort Wainwright, as detailed in Section 2.3 of the EIS. USAG Alaska developed a screening process to determine which of the alternatives considered would meet the project's purpose and need. Thirteen of the 16 action alternatives considered failed to meet one or more of the screening criteria; therefore, those action alternatives were not considered viable and were eliminated from detailed analysis in the EIS.

Three action alternatives met all six criteria; therefore, they were considered reasonable and were carried forward for full analysis in the Draft EIS. The No Action Alternative was also fully analyzed in the Draft EIS in accordance with CEQ regulations (40 CFR § 1502.14). Although the No Action Alternative would not meet the purpose of and need for the Proposed Action, it reflects current conditions and assumes that these status quo conditions would continue into the foreseeable future. The EIS presents detailed information and analyses of the following alternatives:

No Action Alternative. Under the No Action Alternative, USAG Alaska would continue to use the existing heat and electrical infrastructure and would not construct any new infrastructure. To keep the plant operational, USAG Alaska would need to complete major repairs, update technologies, upgrade 27 miles of the steam distribution system with the utilidors, and incorporate BACTs. To meet federal emissions standards, the CHPP boilers would continue to operate at 20 percent reduced capacity, which reduces the existing plant's ability to support the USAG Alaska and USARAK missions.

Alternative 1: Build New Coal CHPP. Under Alternative 1, USAG Alaska would construct a new, modern, coal-fired CHPP and upgrade the steam distribution system. USAG Alaska would demolish the old CHPP after operational transition. The location of the new plant would be in the vicinity of the existing plant to maximize continued use of the existing utilidors. Coal would continue to be the fuel source and be stockpiled on the site. Any additional electricity required would be purchased directly from a local utility provider. Among alternatives carried forward for detailed analysis in the EIS, this alternative would have the highest implementation and operations and maintenance (O&M) costs, and the highest risk for installation-wide loss of heat through distribution (USACE 2018).

Alternative 2: Build New Dual-Fuel Combustion Turbine Generator CHPP. Under Alternative 2, USAG Alaska would replace the existing CHPP with a new, modern, dual-fuel combustion turbine generator CHPP. The system would allow for two online combustion turbine generators (CTGs) to meet summertime peak demands while one is down for maintenance, and two of the heat recovery steam generators to meet peak steam-to-post demands, leaving one for redundancy. The primary fuel for the new plant would be natural gas, with ultra-low-sulfur diesel (ULSD) as the secondary source. As with Alternative 1, USAG Alaska would upgrade the steam distribution system and demolish the old CHPP following operational transition. Under this alternative, USAG Alaska would be required to secure a sustained supply of natural gas or ULSD. USAG Alaska would construct a natural gas supply pipeline between an existing natural gas distribution main and the new CHPP. In accordance with Army Directive 2017-07, USAG Alaska would also construct ULSD fuel storage to maintain a minimum 14-day supply adequate to support facility operations in the event of a substantial energy supply disruption. Among those carried forward for detailed analysis in the EIS, this alternative would enhance fuel source resiliency, be the best environmentally centralized option, and have lower implementation and O&M costs than a coal-fired CHPP (USACE 2018).

Alternative 3: Install Distributed Natural Gas Boilers. Under Alternative 3, USAG Alaska would transition away from a centralized heat and power model by installing multiple high-efficiency natural gas-fired boilers at facilities dispersed across the installation to provide heat, and would purchase all required electricity from a local utility provider. USAG Alaska would demolish the old CHPP once the distributed natural gas boiler system is operational. Portions of the existing steam distribution system would be upgraded as required to accommodate steam and return water distribution to support the distributed boilers and other underground utilities. USAG

Alaska would also be required to secure a sustained natural gas supply to support boiler operations across the installation. In the event of a power outage or natural gas interruption to mission-critical buildings, ULSD-reciprocating combustion generators would be used as emergency backup power or heat sources for boilers. To provide installation-wide electricity resiliency, emergency generators would be placed at the electrical substations on the installation in the event of a local -power interruption. Among those carried forward for detailed analysis in the EIS, this alternative would have the lowest implementation and O&M costs, an energy usage reduction of up to 46 percent from current baseline, and the advantage of emergency generators already in place in mission-critical facilities (USACE 2018).

Summary of Environmental Consequences

Resource areas analyzed for environmental and socioeconomic impacts include air quality, utilities, hazardous and toxic materials and wastes, socioeconomics, environmental justice, noise, land use, transportation and traffic, human health and safety, geology and soil resources, water resources, cultural resources, and airspace.

All action alternatives would result in short-term, negligible to minor adverse impacts that would be limited to the construction period. Similarly, the No Action Alternative would result in short-term, negligible to minor, adverse impacts during repairs, which would be necessary throughout the operations period. Such temporary impacts, which could include increases in traffic, noise, stormwater runoff and turbidity, soil disturbance, and air emissions, would largely be minimized through standard operating procedures and best management practices (BMPs). Short-term, beneficial impacts, such as temporary jobs during construction and repair work, would also be expected as a result of any one of the alternatives evaluated.

All three action alternatives would result in long-term, beneficial impacts on the ability for Fort Wainwright to carry out its mission. Such beneficial impacts on mission support would be considered significant under all three action alternatives, whereas the No Action Alternative would continue to put the mission at risk over the long-term and potentially lead to significant, adverse impacts on human health and safety.

All three action alternatives would result in greater long-term, beneficial impacts on air quality over existing conditions than the No Action Alternative. The action alternatives would reduce emission levels for seven or more criteria pollutants whereas only one would be reduced by the No Action Alternative. All three action alternatives would reduce CO emissions considerably compared to existing conditions while the No Action Alternative would continue to operate the existing CHPP at reduced capacity to avoid exceeding regulatory CO emissions standards. Although Alternative 2 would improve air quality more than Alternative 1, Alternative 3 would result in the greatest long-term, beneficial impacts on air quality by reducing CO and greenhouse gas emissions by almost 90 percent and over 70 percent, respectively.

None of the action alternatives would result in widespread, long-term significant, adverse impacts on environmental resources. Alternative 2 and Alternative 3, however, would result in long-term, significant, localized adverse socioeconomic impacts on the coal mining sector in Healy. Although the reduction of coal sales and mining jobs under Alternative 2 and Alternative 3 would result in long-term, minor to significant, localized adverse economic impacts on children and low-income populations in Healy, the decrease in emissions would result in long-term, minor, beneficial health impacts, especially for children. All three action alternatives would result in adverse impacts on historical properties on Fort Wainwright. Depending on final design, Alternative 3 would likely result in long-term, significant, adverse impacts on historical properties, and impacts would be reduced to less than significant through mitigation required through Section 106 consultation.

In summary, implementation of any one of the alternatives would, to varying degrees, result in both adverse and beneficial impacts on environmental resources. Table ES-1 provides a summary of potential impacts that could occur under each alternative considered.

A cumulative impact analysis was completed to determine if the combined effects of the Proposed Action in addition to other past, present, and future foreseeable projects in the region could result in a significant impact. This analysis determined that there would be no significant cumulative impacts. The Proposed Action and other identified cumulative projects could result in short-term, minor to moderate, adverse and beneficial, cumulative impacts or less on all resource areas.

Best Management Practices and Mitigation Measures

USAG Alaska is committed to avoiding or mitigating adverse effects to the extent practicable, and has identified measures that would be implemented to avoid, minimize, and/or mitigate impacts on environmental resources. USAG Alaska has incorporated measures to avoid or minimize impacts into the project design and would implement BMPs and construction measures to avoid or further minimize potential impacts.

Table ES-1. Summary of Environmental Impacts

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Air Quality Section 3.2	Short-term, minor, adverse impacts during repairs Long-term (during operations),[a] minor, beneficial impacts: • Reduces 1 criterion pollutant emission level due to implementation of BACT measures	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: • Reduces 8 criteria pollutant emissions levels • 30 percent less water vapor	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: • Reduces 7 criteria pollutant emissions levels • Greater decrease for most pollutants than under Alternative 1 • 32 percent less water vapor	Short-term, minor, adverse impacts during construction Long-term, moderate, beneficial impacts: • Reduces 8 criteria pollutant emissions levels • Substantial decrease in levels for most pollutants • 60 percent less water vapor
Utilities Section 3.3	Short-term, minor, adverse impacts during repairs No impact on coal consumption or heating efficiency: • 42 percent efficient system Long-term, significant, adverse impacts on Fort Wainwright's mission could occur from continued risk of plant failure No change in long-term impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency: • 53 percent efficient system • Less coal consumption Long-term, minor, adverse impact on coal consumption and ash disposal operations Long-term, significant, beneficial impacts on mission support Long-term, moderate, beneficial impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency • 58 percent efficient system • No coal consumption • Cleaner-burning than coal Long-term, moderate, adverse and beneficial impacts on natural gas and ULSD fuel consumption Long-term, significant, beneficial impacts on mission support Long-term, moderate, beneficial impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency: • 75 percent efficient system • No coal consumption • Cleaner-burning than coal Long-term, moderate, adverse and beneficial impacts on natural gas and ULSD fuel consumption Long-term, significant, beneficial impacts on mission support Long-term increased reliance on off-post electricity adds minor risk

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Hazardous and Toxic Materials and Wastes Section 3.4	Short-term, minor, adverse impacts during repairs Long-term, minor, adverse impacts from coal waste stream and ongoing repairs	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction Long-term, minor, adverse impacts from coal ash waste stream	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction Long-term, negligible, adverse impacts from new waste stream Long-term, moderate, beneficial impacts from closure/ remediation of on-post coal supply site	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction; potential to disrupt Military Munitions Response Program, Installation Restoration Program, or unexploded ordnance sites during construction Long-term, negligible, adverse impacts from new waste stream Long-term, moderate, beneficial impacts from closure/ remediation of on-post coal supply site
Socio-economics Section 3.5	Short-term, minor, beneficial impacts during repairs: • Temporary local jobs during ongoing repairs No cost of living impacts Long-term, minor to moderate, adverse impacts on employment and income from rising costs and operating at reduced capacity	Short-term, minor, beneficial impacts from construction: • 2,700 temporary jobs • $183 million labor income • $287 million business sales No cost of living impacts Long-term, moderate, adverse and beneficial impacts on workforce during operation: • $3.9 million labor income • $20.5 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, moderate, adverse impact on coal demand due to improved system efficiency	Short-term, minor, beneficial impacts from construction: • 1,700 temporary jobs • $121 million labor income • $287 million business sales Near-term utility rate increase Long-term, minor to moderate, adverse and beneficial impacts on workforce during operation: • $2.8 million labor income • $13.8 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, significant, localized adverse impact on coal demand	Short-term, minor, beneficial impacts from construction: • 500 temporary jobs • $42 million labor income • $103 million business sales Near-term utility rate increase Long-term, minor to moderate, adverse and beneficial impacts on workforce during operation: • $1.1 million labor income • $2.4 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, significant, localized adverse impact on coal demand

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
			Long-term, minor, beneficial impacts on natural gas sector	Long-term, minor, beneficial impact on natural gas and electrical utility sectors
Environmental Justice Section 3.6	Short-term, minor, adverse impacts during repairs Long-term, minor to moderate, adverse health impacts: coal use and combustion, especially on child populations Long-term, moderate to significant, adverse impacts on mental and physical health for Fort Wainwright population if system fails during winter	Short-term, minor, adverse impacts (noise, traffic) Long-term, minor, beneficial impacts (improved air quality) Long-term, minor to moderate, adverse health impacts: coal use and combustion, similar to No Action Alternative	Short-term, minor, adverse impacts, similar to Alternative 1 Long-term, minor, beneficial health impacts due to reduced emissions Long-term, significant, localized adverse economic impacts low-income populations in Healy from less coal demand	Short-term, minor, adverse impacts, similar to Alternative 1 Long-term, minor, beneficial health impacts due to reduced emissions Long-term, significant, localized adverse economic impacts low-income populations in Healy from less coal demand
Noise Section 3.7	Short-term, minor, adverse impacts during repairs No long-term changes to noise as compared to existing conditions	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise than existing CHPP	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise and rail deliveries of coal would cease	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise and rail deliveries of coal would cease
Land Use Section 3.8	No short- or long-term changes on land use or visual resources	Long-term, minor, beneficial impacts on visual resources from new CHPP	Long-term, minor, beneficial impacts on visual resources, and minor to moderate, adverse impacts from pipeline construction	Long-term, minor, beneficial impacts on visual resources, and minor to moderate, adverse impacts from pipeline construction
Transportation and Traffic Section 3.9	Short-term, minor, adverse impacts during repairs No long-term changes to existing conditions – coal deliveries by rail and coal ash by truck would continue	Short-term, minor, adverse impacts during construction No long-term changes to existing conditions – coal deliveries by rail and coal ash by truck would continue	Short-term, minor, adverse impacts during construction Long-term, negligible to minor, beneficial impacts, no coal deliveries and less truck traffic Long-term, negligible to minor, adverse impacts from natural gas and ULSD truck delivers	Short-term, minor, adverse impacts during construction Long-term, negligible to minor, beneficial impacts, no coal deliveries and less truck traffic Long-term, negligible to minor, adverse impacts from natural gas and ULSD truck delivery

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Human Health and Safety Section 3.10	Short-term, minor, adverse impacts during repairs Long-term, moderate to significant, adverse impacts on health by not reducing risk of outage; perpetuates safety risks Continues coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Continues coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Avoids coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Avoids coal use
Geology and Soil Resources Section 3.11	Short-term, negligible to minor, adverse impacts during repairs	Short-term, negligible to minor, adverse impacts during construction	Short-term, negligible to minor, adverse impacts during construction	Short-term, negligible to minor, adverse impacts during construction
Water Resources Section 3.12	Short-term, negligible to minor, adverse impacts on water quality during repair work No long-term, adverse impacts on water resources	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater
Cultural Resources Section 3.13	No long-term, adverse impacts on cultural resources	Long-term, minor, adverse impacts on Ladd Field National Historic Landmark (NHL) from utilidor upgrades; would be less than significant with mitigation Long-term, minor, adverse impact on viewshed of distant historic properties No impacts on archaeological resources	Long-term, minor, adverse impacts on Ladd Field NHL from utilidor upgrades; would be less than significant with mitigation Long-term, minor, adverse impact on viewshed of distant historic properties No impacts on archaeological resources	Long-term, significant, adverse impacts on Ladd Field NHL and Ladd Air Force Base Cold War Historic District from construction of facilities near historic resources, and on Ladd Field NHL from utilidor upgrades; would be less than significant with mitigation No impacts on archaeological resources
Airspace Section 3.14	No impact on airspace management	No impact on airspace management	No impact on airspace management	No impact on airspace management

Note:

[a] Long-term refers to the operation period (i.e., after initial construction for action alternatives).

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Acronyms and Abbreviations

°F	degree Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AAC	Alaska Administrative Code
AAF	Army Airfield
AC	Advisory Circular
ACM	asbestos-containing material
ACP	Access Control Point
ADCCED	Alaska Department of Commerce, Community, and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADNL	A-weighted day-night sound level
ADNR	Alaska Department of Natural Resources
ADOLWD	Alaska Department of Labor and Workforce Development
ADOT&PF	Alaska Department of Transportation and Public Facilities
ADP	Area Development Plan
AFB	Air Force Base
AFS	Air Force Station
AGDC	Alaska Gasline Development Corporation
AHRS	Alaska Heritage Resources Survey
AIDEA	Alaska Industrial Development and Export Authority
ANC	Alaska Native Corporation
ANCSA	Alaska Native Claims Settlement Act
APDES	Alaska Pollutant Discharge Elimination System
APZ	accident potential zone
AQCR	Air Quality Control Region
AR	Army Regulation
Army	U.S. Department of the Army
ARRC	Alaska Railroad Corporation
AST	aboveground storage tank
BACT	Best Available Control Technology
bcf	billion cubic feet
BLM	Bureau of Land Management
BMP	best management practice
Btu	British thermal unit

CAA	Clean Air Act
CDNL	C-weighted day-night sound level
CDP	census-designated place
CEMML	Center for Environmental Management of Military Lands
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CHPP	central heat and power plant
CO	carbon monoxide
CPSC	Consumer Product Safety Commission
CWA	Clean Water Act
CWHD	Cold War Historic District
dB	decibel
dBA	A-weighted decibel
DERP	Defense Environmental Restoration Program
DHHS	U.S. Department of Health and Human Services
DHSEM	Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management
DLA	Defense Logistics Agency
DNL	day-night sound level
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FAA	Federal Aviation Administration
FAI	Fairbanks International Airport
FAST Planning	Fairbanks Area Surface Transportation Planning
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission

FMATS	Fairbanks Metropolitan Area Transportation System
FNSB	Fairbanks North Star Borough
FNSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FY	fiscal year
GHG	greenhouse gas
GVEA	Golden Valley Electric Association
HRSG	heat recovery steam generator
IEP	Interior Energy Project
IGU	Interior Gas Utility
IRP	Installation Restoration Program
kg	kilogram
kg/MMBtu	kilograms per million British thermal units
kWh	kilowatt-hour
lb	pound
lb/hr	pounds per hour
lb/MMBtu	pound per million British thermal units
LBP	lead-based paint
L_{eq}	equivalent sound level
LNG	liquefied natural gas
LQG	Large Quantity Generator
LOS	Level of Service
LUPZ	Land Use Planning Zone
LUST	leaking underground storage tank
MDA	Missile Defense Agency
MEDDAC – AK	Medical Department Activity – Alaska
MFH	military family housing
mgd	million gallons per day
MMBtu	million British thermal units
MMBtu/hr	million British thermal units per hour
MMRP	Military Munitions Response Program
mph	miles per hour
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Sector General Permit
MW	megawatt
MW/hr	megawatts per hour

MWh	megawatt-hours
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NO_X	nitrous oxide
NOA	Notice of Availability
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
O_3	ozone
O&M	operation and maintenance
ORL	Owner Requested Limit
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PACAF AOR	Pacific Air Forces Area of Responsibility
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
pga	peak ground acceleration
PFAS	perfluoroalkyl and polyfluoroalkyl substances
P.L.	Public Law
PM	particulate matter
$PM_{2.5}$	particulate matter smaller than 2.5 microns in diameter
PM_{10}	particulate matter smaller than 10 microns in diameter
POL	petroleum, oil, and lubricants
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PSR	Physicians for Social Responsibility

PTE	potential to emit
RCRA	Resource Conservation and Recovery Act
REPI	Readiness and Environmental Protection Integration
ROD	Record of Decision
ROI	region of influence
RPMP	Real Property Management Plan
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SOP	standard operating procedure
SPCC	Spill Prevention, Control, and Countermeasure
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
tpy	tons per year
TRB	Transportation Research Board
TRI	Toxic Release Inventory
TRS	Tontechnik-Rechner-SengPiel Audio
TSCA	Toxic Substances Control Act
UAS	Unmanned Aircraft System
UESC	Utility Energy Service Contract
UFC	Unified Facilities Criteria
ULSD	ultra-low-sulfur diesel
UPC	Utility privatization contract
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USAG	U.S. Army Garrison
USARAK	U.S. Army Alaska
U.S.C.	United States Code
USCB	U.S. Census Bureau
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WRCC	Western Regional Climate Center

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1. Purpose of and Need for the Action

1.1 Introduction

This Environmental Impact Statement (EIS) is being prepared to address the proposal by the U.S. Army Garrison (USAG) Alaska to upgrade the on-post heat and electrical generation and distribution capabilities at Fort Wainwright, Alaska. Fort Wainwright's mission is to integrate resources and deliver installation services to enable the readiness of the U.S. Department of the Army (Army) forces in Alaska while enhancing the quality of life for Soldiers, families, and the on-post community. The Soldiers, Families, and Civilian personnel who make up the Fort Wainwright population are reliant upon a coal-fired central heat and power plant (CHPP) and a heat distribution system to generate and supply heat and power to more than 400 facilities across the installation. This heat and power system, operating beyond its useful life, is becoming exponentially more expensive to operate, and faces a significant overhaul to operate reliably and meet environmental quality standards.

USAG Alaska bears the responsibility to provide reliable, economically efficient, and operationally sustainable heat and electrical generation and distribution capabilities at Fort Wainwright. In accordance with Army Directive 2017-07 (Installation Energy and Water Security Policy) (Department of Defense [DoD] 2017a], the Army will prioritize energy and water security requirements to ensure available, reliable, and quality power and water to continuously sustain critical missions. This effort will include coordinating vulnerability and risk assessments of potential energy and water resource disruptions and implementing adequate response to mitigate identified risks. The Army will reduce risk to critical missions by being capable of providing necessary energy and water for a minimum of 7 days. The Army will improve resilience at installations, including planning for restoration of degraded energy and water systems and reducing risks of future disruptions by addressing the following attributes: (1) ensured access to resource supply by having redundant and diverse sources of supply, including renewable energy, that meet evolving mission requirements during normal and emergency response operations; (2) reliable infrastructure condition capable of onsite energy and water storage along with flexible and redundant distribution networks; and (3) effective system operations with trained personnel who conduct required system planning, operations, and sustainment activities for energy and water security.

In 2008, USAG Alaska entered into a 50-year utility privatization contract (UPC) with a local utility provider authorized by the Defense Reform Initiative Directive (10 United States Code [U.S.C.] § 2688) that allows the DoD to transfer utility assets to any municipal, private, regional, district, or cooperative utility company or to any other entity. Under the UPC, the installation generates all heating requirements at the CHPP and most of its own electricity; the remainder of the required electricity is purchased under a separate power purchase contract from the local electric utility located off-post. Since 2008, the System Owner, under the UPC, has made improvements to the CHPP, the electrical distribution system, and portions of the steam delivery pipeline; however, the antiquated infrastructure is operationally inefficient, creating high utility costs and emission exceedances. Continued reliance upon the existing system would present critical risks to Fort Wainwright's operations and to mission sustainability into the future.

Because the existing CHPP and its heat distribution system is operating beyond its useful life and presents a risk to Fort Wainwright's mission, USAG Alaska is evaluating alternative on-post heat and electricity generation and distribution capabilities. Although the CHPP is operated under the UPC, the Army is the landowner and would be paying for construction of a replacement electricity and heat generating alternative to sustain its needs into the future. Therefore, USAG Alaska is responsible for the development of this EIS in compliance with the National Environmental Policy Act (NEPA).

This EIS is being prepared in accordance with NEPA of 1969, as amended (42 U.S.C. § 4321 et seq.); NEPA-implementing regulations issued by the President's Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the Army's NEPA-implementing regulation (32 CFR Part 651, Environmental Analysis of Army Actions).

1.1.1 Project Location

Fort Wainwright is in Interior Alaska and is located in the Fairbanks North Star Borough (FNSB), north of the Alaska Range in the Tanana River Valley (see Figure 1.1-1). The installation is on the eastern edge of the urbanized portions of the City of Fairbanks, the largest city (population of approximately 31,644) in the FNSB. It is home to USAG Alaska and units of the U.S. Army Alaska (USARAK). Situated at 65 degrees north latitude, the installation has a subarctic climate. The installation includes the Main Post (approximately 15,536 acres) and several training areas outside the Main Post. The CHPP is located on the Main Post. The Main Post consists of five planning districts: the North Post, South Post, West Post, and Ladd Airfield districts are within the Main Cantonment Area, and the Chena North district is north of the Main Cantonment Area (Figure 1.1-2).

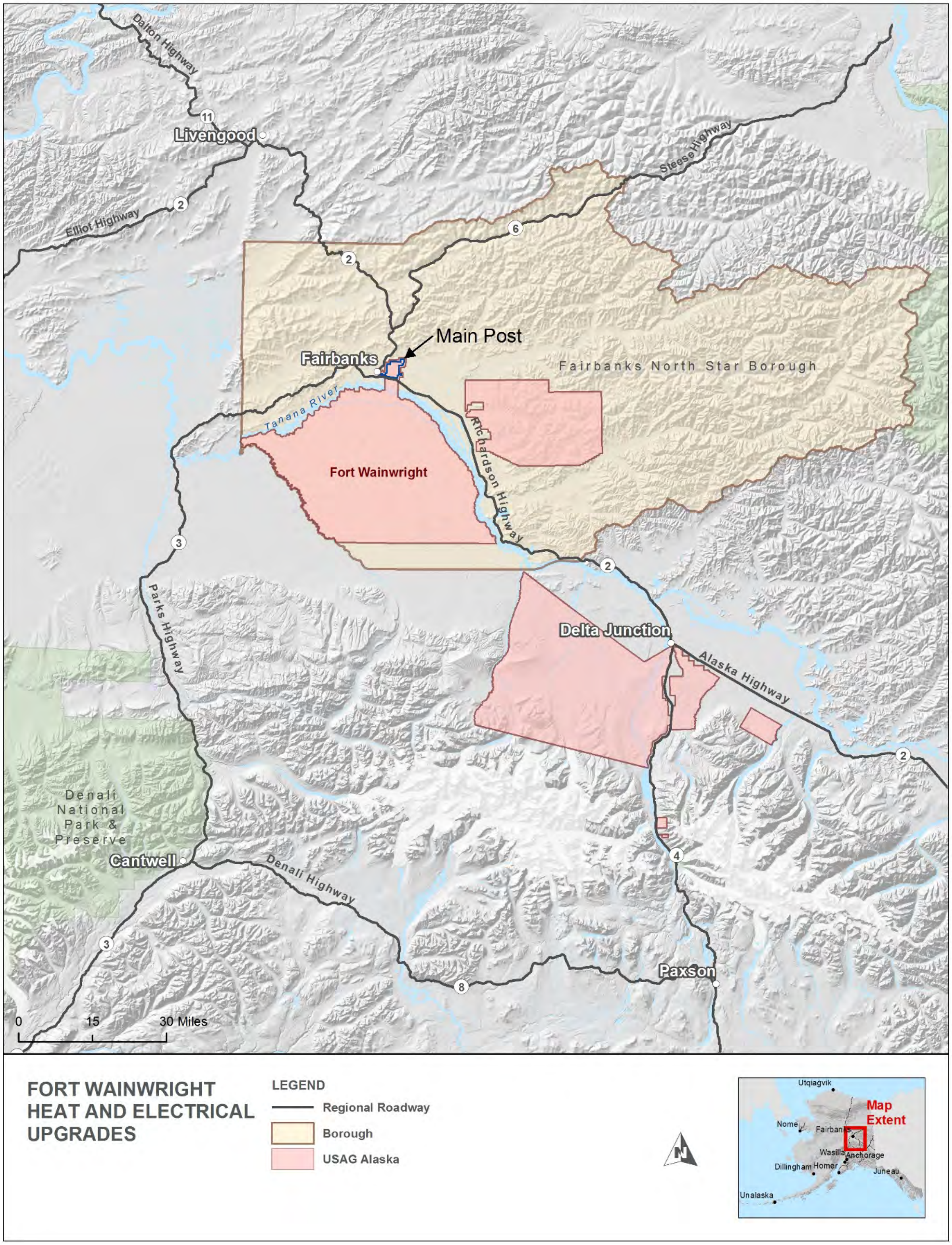

Figure 1.1-1. Project Location

Figure 1.1-2. Main Post

1.1.2 Background Information

The CHPP at Fort Wainwright, completed by the U.S. Army Corps of Engineers (USACE) in 1955, is one of the oldest operational coal-fired power plants in the United States, and is operating approximately 30 years beyond the average design life of similar facilities (USACE 2018, SourceWatch 2017). The current configuration of the CHPP is six coal-fired 150,000-pounds-per-hour (lb/hr) steam boilers and three extraction-type condensing steam turbines rated at 5 megawatts (MW) each and a single back-pressure turbine rated at 4 MW. The CHPP produces all heat needed by the installation and up to 19 MW of electricity. The installation has a peak electricity demand of 21 MW per hour (MW/hr) and an average annual heat demand of 45 MW/hr (Stringham 2019). Any additional electricity required by Fort Wainwright is purchased directly by USAG Alaska from an off-post utility provider. Steam produced by the power plant's coal-fired boilers is routed through pipes in a series of underground tunnels called utilidors and is used to heat the installation's buildings. More than half of the 30 miles of utilidor piping has not been replaced within the last 30 years (Black and Veatch 2018). The electricity produced at the CHPP is distributed through a series of overhead distribution lines, underground distribution circuits, street lighting circuits, and airfield lighting cables. Current utility costs associated with heating and supplying electricity across the installation are approximately $58 million per year (including purchased fuel/utilities and UPC costs) and are expected to rise exponentially over the next 40 years (USACE 2018).

Starting in 2008, all utilities (heat, electricity, water, and wastewater) at Fort Wainwright were privatized under a 50-year UPC that is managed by a System Owner. The System Owner is 50 percent owned by a regional Alaska Native Corporation (ANC) established under the Alaska Native Claims Settlement Act (ANCSA) of 1971. Depending on the alternative selected, the System Owner, and therefore the ANC, may experience some impact on capital investment (and profit) and operation and maintenance (O&M) of the existing systems.

The UPC at Fort Wainwright is a regulated tariff-based contract under which the contractor makes an agreed upon rate of return (referred to as "interest" in common language) by investing money in the utility infrastructure. The O&M cost is a pass-through cost; whatever it costs to maintain the system, the government reimburses the System Owner with no additional profit or markup on O&M.

Three recent studies assessed lifecycle costs and operational requirements for various heat and energy generation alternatives to facilitate identification of economically and operationally viable options for Fort Wainwright: *Business Case Analysis: Heat and Electricity Alternatives for Fort Wainwright, Alaska* (Guernsey 2015); *Energy Master Plan, Fort Wainwright, Alaska* (Black and Veatch 2018); and *Life-Cycle Cost Analysis for Heat and Electric Power Alternatives for Fort Wainwright, Alaska* (USACE 2018). The studies also identified concerns with the condition of some major components of Fort Wainwright's existing CHPP and heat distribution system. The energy performance of the heat distribution system was evaluated and found to be underperforming compared to systems of similar size and age; and reportedly about 60 percent of the heat energy generated at the plant is lost through process conversion losses before reaching its intended facilities (Guernsey 2015). Because of the CHPP's operational inefficiencies, Fort Wainwright has one of the highest utility costs per square foot for Army installations in the United States (USACE 2018). The high utility costs are only expected to increase due to projected costs associated with maintenance of the facility and utilidor system.

The three studies further indicate that continued reliance upon the existing system presents substantial risk to life-safety and mission readiness. Given the subarctic climate within which the CHPP must operate, technological endurance and capacity to adequately function in the extreme cold are critical. A winter-time loss of the CHPP's ability to generate heat and power would be considered a catastrophic event that would require immediate actions to evacuate the installation. Within the last decade, the CHPP has experienced near-catastrophic critical failures, including a rupture in a steam main serving the entire North Post in 2014 and two separate control system malfunctions in 2012, each at four of the plant's six boilers. These failures each resulted in halting the CHPP's ability to generate electricity and provide steam to the primary utilidor supporting the North Post area of the installation, and each required several weeks for full repair (Guernsey 2015, USACE 2018). In addition, eight unexpected installation-wide outages due to maintenance, repair, or operational challenges associated with the aging infrastructure occurred in 2017 (USACE 2018), and on October 14, 2018, a coal dust fire occurred in the south coal tower to which five local fire departments responded. The CHPP suffered damage, and workarounds were used to continue plant operations and accommodate the required facility repairs.

The CHPP has periodically failed to meet state and federal air emissions standards. The Alaska Department of Environmental Conservation (ADEC) issued a January 2018 notice of violation to the CHPP's System Owner for exceeding statutory carbon monoxide (CO) emission limits. To meet the statutory CO limits and comply with the federal emissions standards, the System Owner is now required to operate CHPP boilers at 20 percent reduced capacity. Operating the CHPP at a less-than-optimal level of efficiency only furthers the existing fiscal and operational constraints on the USAG Alaska mission. Furthermore, the U.S. Environmental Protection Agency (EPA) has designated the FNSB, which includes Fort Wainwright, as a serious nonattainment area for particulate matter (PM) smaller than 2.5 microns in diameter ($PM_{2.5}$). To meet statutory limits for $PM_{2.5}$, USAG Alaska is required to implement Best Available Control Technology (BACT) at the heat and power plant (ADEC 2019a). Implementation of BACT would place fiscal burden on USAG Alaska at costs approximated between $22 million and $235 million to bring the 65-year old CHPP into compliance with the Clean Air Act (CAA) (ADEC 2019a, Agrawal 2020).

Continuing to rely on and maintain the existing CHPP and distribution system has shown to be uneconomical, undependable, and a threat to environmental air quality that presents substantial risks to the USAG Alaska and USARAK missions and weakens the resilience of the installation.

1.2 Purpose and Need for Action

The purpose of the Proposed Action is to provide reliable heat and electrical infrastructure for the installation that resolves current safety, resiliency, fiscal, and regulatory concerns. The Army's current target, contingent on available funds, would be to implement the project by approximately 2026.

As noted in Section 1.1.2, continued reliance on Fort Wainwright's existing coal-fired CHPP and distribution systems poses risks to safety, is not fiscally sustainable, and has periodically failed to meet air emissions standards. The existing CHPP and distribution system are operating beyond their design life, which has resulted in the following: one of the highest utility costs to the Army (USACE 2018); near-critical failures in the last 10 years; exceedance of emission limits; and jeopardy of Fort Wainwright's mission. USAG Alaska needs to construct reliable heat and electrical infrastructure that would achieve the following:

- Reduce the overall utility costs by having a system that runs more efficiently and has lower O&M costs
- Minimize the risk of a single-point catastrophic failure that may require evacuating the installation and may severely affect mission readiness
- Increase energy efficiency
- Be compliant with emissions standards
- Conform to energy security standards in accordance with Army Directive 2017-07

1.3 Scope of the Environmental Impact Statement

USAG Alaska has prepared this EIS to evaluate the potential direct, indirect, and cumulative impacts associated with implementation of the Proposed Action and No Action alternatives. To understand the environmental consequences of the decision to be made, the EIS evaluates the environmental impacts of the alternatives.

1.3.1 Regulatory Framework

Army installations are guided by relevant statutes (and their implementing regulations) and executive orders (EOs) that establish standards and provide guidance on environmental compliance, including natural and cultural resources management and planning. Pulling from the list within 32 CFR § 651.14(e), the below statutes and EOs apply to the Proposed Action and No Action alternatives. The EIS addresses these requirements in one place so the decision-maker has a concise and comprehensive view of the major environmental issues and understands the interrelationships and potential conflicts among the environmental resource areas. Regulatory requirements applicable for each resource area addressed in this EIS are further described in Chapter 3.

Major statutes and EOs that apply to the Proposed Action are as follows:

- Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa–470mm)
- Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668–668c)
- CAA (42 U.S.C. §§ 7401–7671q)
- Clean Water Act (CWA), Sections 401, 402, and 404 (33 U.S.C. §§ 1251–1387)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. § 9601)
- Endangered Species Act (16 U.S.C. §§ 1531–1544)
- EO 11514 as amended by EO 11991, Protection and Enhancement of Environmental Quality
- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 11988, Floodplain Protection
- EO 11990, Protection of Wetlands
- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12580, Superfund Implementation
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13834, Efficient Federal Operations
- Migratory Bird Treaty Act (16 U.S.C. §§ 703–712)
- National Historic Preservation Act of 1966 (54 U.S.C. § 300101)
- Pollution Prevention Act of 1990 (42 U.S.C. §§ 13101–13109)
- Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C. § 6901)
- Sikes Act and Sikes Act Improvement Act (16 U.S.C. §§ 670a–670o), Conservation Programs on Government Lands
- Toxic Substances Control Act (TSCA; 15 U.S.C. §§ 2601–2629)

1.3.2 Organization of this Draft EIS

The EIS is organized into six chapters and appendices. Chapter 1 contains the purpose, need, scope, and public involvement efforts for the Proposed Action. Chapter 2 contains a detailed description of the Proposed Action and the alternatives considered. Chapter 3 describes the existing conditions of the affected environment, and identifies the environmental impacts of implementing all reasonable action alternatives and the No Action Alternative. Chapter 3 also summarizes the cumulative impacts associated with past, present, and reasonably foreseeable future actions when combined with the Proposed Action and alternatives. Chapter 4 provides the names of those persons who prepared the Draft EIS. Chapter 5 identifies the local, state, and federal agencies, tribal governments, and other interested parties that requested to be included in the stakeholder distribution list for project-related information. Chapter 6 lists the references used to support the analysis. Chapter 7 provides a glossary of terms, and Chapter 8 provides an index for this document. Appendices provide additional information, as referenced throughout this EIS.

1.4 Decision to be Made

As a result of the EIS process, the Army plans to select one of the alternatives analyzed in this EIS, enabling a decision informed by knowledge of anticipated environmental and socioeconomic impacts, and the public's concerns. With the selection of an alternative, which will be documented in a Record of Decision (ROD), the Army decision-maker will also identify mitigations to be pursued to reduce the environmental impacts of the selected alternative.

1.5 Public Involvement

The Army invites public participation in the NEPA process. The perspectives, needs, interests, and data provided by interested persons promote open communication and enable better decision-making. All agencies, organizations, and members of the public that have a potential interest in the Proposed Action are urged to participate in the decision-making process. Information on the status of the process is available on the USAG Alaska NEPA website at:
https://home.army.mil/alaska/index.php/fort-wainwright/NEPA/HEU-EIS.

1.5.1 Scoping

Scoping is a formal process to help the Army determine the scope of analysis needed in the EIS. In accordance with 32 CFR Part 651, the Army published a Notice of Intent (NOI) to prepare an EIS in the *Federal Register* on July 22, 2019 (*Federal Register*, Vol. 84, No. 140). The NOI initiated the scoping period (July 22, 2019, to August 21, 2019) during which members of the public, including federal, state, and local agencies, affected federally recognized tribes, and other interested persons, were invited to comment on the proposed scope and content of the EIS. As part of the scoping process, USAG Alaska held a public scoping meeting and an agency scoping meeting. The Army also published a series of notices in the *Fairbanks Daily News-Miner.* Digital advertisements were placed on the State of Alaska Online Public Notice website, USAG Facebook page, Directorate of Public Works Facebook page, Environmental Division Facebook page, and What's Up Listserv. These announcements were intended to inform the local community of the Army's intent to prepare an EIS and to hold a public scoping meeting to discuss the proposed project and solicit public comments for consideration in the development of alternatives and subsequent efforts for impacts analysis. On July 23, 2019, USAG Alaska mailed letters to tribal organizations to invite them to attend the August 8, 2019, public scoping meeting. For information on Tribal Coordination, see Section 1.5.2. The public scoping meeting, which took place in Fairbanks, Alaska, on August 8, 2019, at the Carlson Center Pioneer Room, was attended by 45 individuals. USAG Alaska also held an agency scoping meeting on August 7, 2019, in Fairbanks and sent scoping invitation letters to local, state, and federal agencies and other interested parties to solicit participation. An example of each scoping letter is provided in Appendix A.

A total of 42 individuals and agencies provided comments to USAG Alaska during the scoping period, with a few commenters expressing a desire for a longer comment period. Comments were received via the project's public email address at usarmy.wainwright.id-pacific.mbx.heu-eis@mail.mil, on comment forms, and in letters via email or regular mail. A court reporter at the scoping meetings also recorded verbal comments. See Appendix B for scoping comments.

The primary topics expressed in the scoping comments received are as follows:

Socioeconomics: Comments expressed uncertainty about the future of a local coal provider, which is a major economic contributor in the local area, if the energy source considered is something other than coal. Some commenters were concerned about the availability and affordability of natural gas. There were also concerns about the economic impact the project would have on Interior Alaska.

Environmental Effects: Comments were expressed regarding air quality, carbon dioxide emissions, water pollution, climate change, and Fairbanks' designation as a nonattainment area. Other environmental-related comments were about the project's cumulative effects. Comments were expressed that the NOI was incorrect in stating that the current system is failing to meet air emissions standards.

Proposed Alternatives: Overall, comments regarding the proposed alternatives were split between a preference for coal, gas, or alternative energy. Coal supporters argued for easy access and low costs. Gas supporters argued for cleaner energy and increased demand for gas, which would result in further development of gas infrastructure. Alternative energy supporters expressed primarily a desire for cleaner energy generation.

Additional Alternatives: A need for additional alternatives was expressed. Possible alternatives mentioned included coal gasification, river turbines, use of two smaller coal-fired CHPPs, incineration of recycled paper and cardboard and a methane capture facility.

1.5.2 Tribal Coordination

The Army has coordinated with tribal governments, various federal, state, and local agencies, and other interested parties throughout the NEPA process. On July 23, 2019, USAG Alaska mailed letters to tribal organizations to invite them to attend the August 8, 2019, public scoping meeting and to offer the opportunity for a Tribe-specific scoping meeting or government-to-government consultation. The Army initiated Alaska Native tribal consultation under Section 106 of the National Historic Preservation Act (NHPA) (Appendix A). Because a preferred alternative has not yet been selected, Section 106 consultation has been limited to initiation of consultation (Cook 2019).

Doyon, Limited, a for-profit regional ANC that was established under ANCSA, requested consultation with the Army in a letter dated February 28, 2020. Doyon, Limited, holds 50 percent ownership interest in the current utility privatization contractor. Consultation did not occur because Doyon Limited, is not a recognized tribe; however, in response to this request, a meeting was held on May 7, 2020, between the USAG Alaska Garrison Commander and Doyon, Limited, leadership to address topics of concern. A follow-up letter was received from Doyon, Limited, on May 15, 2020, summarizing the points of discussion from the May 7 meeting and addressing the lack of immediate need for future meetings.

1.5.3 Draft EIS Public Comment Period

This Draft EIS was filed with EPA, which announced the availability of the EIS, and the Army also published a Notice of Availability (NOA) in the *Federal Register*. Publication of the NOA in the *Federal Register* initiated a 60-day comment period for the Draft EIS, an additional 15 days longer than the minimum required comment period. Methods similar to those used during the scoping period were also used to notify the public, agencies, and interested organizations of the public review period for the Draft EIS, including publication of the NOA in local newspapers and a mailing of the Draft EIS to potentially interested parties who were not accessing the document from the Internet. The Draft EIS is available for public review at the Noel Wien Library in Fairbanks, Alaska, at the Fort Wainwright Library, and at the Tri-Valley Community Library in Healy, Alaska, if these facilities are open. Additionally, an electronic copy of the Draft EIS is available online at: https://home.army.mil/alaska/index.php/fort-wainwright/NEPA/HEU-EIS. A web-based online open house and telephonic public forum will be held during the 60-day review period to provide an opportunity for the public, Alaska Native tribal governments and organizations, and regulatory agencies to present comments and information.

USAG Alaska will consider all comments on the Draft EIS received during the comment period prior to determining which alternative would be the Army's preferred alternative. The preferred alternative will be identified in the Final EIS. The Final EIS will address and respond to substantive comments received on the Draft EIS. All comments received during the 60-day public review period for the Draft EIS will be included as an appendix in the Final EIS.

The selected alternative will take into account technical and economic feasibility; environmental and social issues; and the ability to meet USAG Alaska and USARAK mission objectives. The USAG Alaska Garrison Commander will sign the Final EIS. The final decision and rationale for selection of an alternative will be presented in a ROD, which will be signed by the Executive Deputy to the Commanding General U.S. Army Installation Management Command.

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2. Description of the Proposed Action and Alternatives

2.1 Introduction

USAG Alaska considered a wide range of potential alternatives for heating and powering the installation, based on the heat and electricity studies discussed in Section 1.1.2 and input gathered during the scoping period. USAG Alaska developed screening criteria to evaluate the viability of each alternative and determine whether it would meet the purpose and need of the Proposed Action. Through this process, the Army identified which alternatives were considered reasonable and legally viable for meeting the purpose and need of the Proposed Action. This chapter describes the Proposed Action and identifies 16 action alternatives considered, screening criteria used to evaluate the viability of the alternatives, and outcome of the viability analysis. It identifies the alternatives that failed to meet the screening criteria and were eliminated from further consideration, and describes in detail the alternatives carried forward for full analysis in this EIS. The Army will consider comments received on the Draft EIS prior to selecting a preferred alternative.

2.2 Proposed Action

The Proposed Action is to upgrade USAG Alaska's heat and electrical generation capabilities to resolve current safety, resiliency, fiscal, and regulatory concerns. The Army's current target, contingent on available funds, would be to implement the project by approximately 2026. To adequately heat and provide power to installation facilities year-round and ensure sustained operational readiness and mission security into the future, USAG Alaska determined that the Proposed Action would need to generate an annual average of 45 MW of heat energy and 19 MW of electrical capacity and be able to meet federal and state environmental regulations, including air quality standards for the region, as stated in Section 1.2.

2.3 Screening Criteria, Alternatives Considered, and Results of Viability Analysis

2.3.1 Screening Criteria

USAG Alaska developed the following screening criteria against which each alternative was compared to determine whether it would satisfy the project's purpose and need, as presented in Section 1.2. An alternative was considered non-viable and reasonably eliminated from detailed consideration in the EIS if it failed to satisfy any one of the following screening criteria. An alternative was considered viable if it met all six screening criteria. Viable options were carried forward for full analysis in the EIS. The list of potential alternatives considered and results of the viability analysis are provided in Section 2.3.2.

Addresses Current Cost Constraints (Screening Criterion 1): The action must directly address the current constraints in operation and cost of maintenance of the existing CHPP and distribution system. This criterion includes realizing efficiencies where possible.

Provides Compatibility with Mission and Energy Security Needs (Screening Criterion 2): In accordance with Army Directive 2017-07, the action must be compatible with the current and future mission and energy security needs by being capable of allowing the critical mission load to continue operations for a minimum of 14 days in the event of a major energy disruption. The operations include measures implemented to deter anti-terrorism threats, equipment malfunctions, and/or catastrophic failures.

Achieves Cost Efficiency with Funding Mechanism (Screening Criterion 3): The action must be cost-efficient (i.e., not be prohibitively expensive) based on a 40-year life cycle cost. It must also have a reasonably foreseeable funding source, or a mechanism for obtaining applicable and timely funding to pay for life, health, and safety upgrades; new construction; or demolition.

Uses Adequate Technology for Subarctic Environment (Screening Criterion 4): The action must use technology that is mature enough to reduce uncertainty about its operation and fuel source availability in a subarctic environment.

Minimizes Environmental Impacts (Screening Criterion 5): The action must minimize environmental impacts and be able to meet federal and state regulatory requirements, including air quality thresholds.

Provides On-Installation Location with Minimized Disruption to Mission (Screening Criterion 6): Heat generation and critical mission power generation must be located on Fort Wainwright for energy security purposes and must not interfere with ongoing mission and training activities.

2.3.2 Alternatives Considered

The Army screened a total of 16 alternatives for viability, plus the No Action Alternative. Eleven of the alternatives were based on those identified in the Guernsey (2015) and USACE (2018) studies (described in Section 1.1.2). Further, the viability analysis uses the conservative assumptions described in those studies, along with those in a 2009 study on renewable energy opportunities at Fort Wainwright (U.S. Department of Energy [DOE] 2009) for how each heat and electricity generating alternative would be constructed, operated, and maintained. The following action alternatives were developed based on heat and electrical studies conducted at Fort Wainwright:

- Alternative 1: Build New Coal CHPP
- Alternative 2: Build New Dual-Fuel Combustion Turbine Generator CHPP
- Alternative 3: Install Distributed Natural Gas Boilers
- Alternative 4: Build New Oil-Fired CHPP
- Alternative 5: Upgrade Existing CHPP and Convert to Gas or Oil Fuel
- Alternative 6: Upgrade Existing CHPP to Heat Only and Convert to Gas or Oil Fuel
- Alternative 7: Upgrade Existing CHPP and Convert to Biomass Fuel

- Alternative 8: Install Nuclear Power Generation
- Alternative 9: Install Wind Power Generation
- Alternative 10: Install Solar Power Generation
- Alternative 11: Provide Heat from Local Utility Provider

During the scoping period, stakeholders identified additional alternatives for the Army's consideration. USAG Alaska screened the following alternatives identified by stakeholders:

- Alternative 12: Construct and operate a coal gasification plant that would convert coal to syngas (a mixture of coal with water and oxygen) to generate energy
- Alternative 13: Construct and operate a methane capture facility that would convert methane collected from landfills and other sources to energy
- Alternative 14: Construct and operate in-water current turbines in local rivers to generate electricity
- Alternative 15: Construct and operate two separate on-installation CHPPs
- Alternative 16: Pelletize and incinerate recycled paper and cardboard to generate energy

2.3.3 Results of Viability Analysis

Table 2.3-1 demonstrates the application of the screening criteria for each alternative. Within the table, viability analysis alternatives are listed in the first column and each screening criterion is listed across the columns to the right. Each row provides a color-coded summary of information for the associated alternative listed in the first column. White indicates that the alternative meets the screening criterion in the column header; gray indicates that it does not. Text within each cell briefly describes how a criterion is or is not met by the associated alternative, along with the letter Y if the alternative meets the criterion, or the letter N if it does not.

Thirteen of the 16 action alternatives considered failed to meet one or more of the screening criteria and therefore were not considered viable. These alternatives, which were eliminated from detailed analysis, are described in Section 2.4. The three action alternatives that met all six criteria, and therefore were considered reasonable, were carried forward for full analysis. The three reasonable action alternatives, along with the No Action Alternative, are described in Section 2.5.

Table 2.3-1. Matrix of Considered Alternatives Evaluated with the Screening Criteria

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints 1	**Provides Compatibility with Mission and Energy Security Needs 2**	**Achieves Cost Efficiency with Funding Mechanism 3**	**Uses Adequate Technology for Subarctic Environment 4**	**Minimizes Environmental Impacts 5**	**Provides On-Installation Location with Minimized Disruption to Mission 6**
No Action Alternative	N – Continuing with the existing CHPP does not address current cost constraints because it would have ongoing upgrade and repair and replacement costs.	Y – Coal can be stockpiled to meet energy security needs in accordance with Army policy.	N – Based on a 40-year lifecycle cost analysis, continuing with existing CHPP is not cost efficient.	Y – Though not optimal, the existing CHPP uses adequate technology to meet subarctic climate conditions.	N – Continuing to use the existing CHPP would not minimize the current environmental impacts. Y – The existing CHPP would be maintained to comply with federal and state environmental regulations.	N – Although the CHPP is currently located on Fort Wainwright, because it is becoming increasingly unreliable, it poses a threat to training activities and interferes with the ongoing mission.
Alternative 1 Build New Coal CHPP	Y – Demolition of the existing CHPP and construction and operation of a modern coal plant would eliminate existing repair and maintenance costs.	Y – Power and heat generation via the new plant and supplemental purchase of electricity through a local utility provider would support mission requirements into the future. The onsite coal stockpile would meet the 14-day supply requirement for energy security.	Y – Operation of a modern plant with an upgraded distribution system would realize cost savings through increased energy efficiency and reduced repair and maintenance costs.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Construction and operation of modern heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would remain operational until the new plant is online. The new plant would generate the required 45 MW of heat energy annually and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.

Viability Analysis Alternative	**Screening Criteria**					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 2 Build New Dual-Fuel Combustion Turbine Generator CHPP	Y – Demolition of the existing CHPP and construction and operation of a modern dual-fuel plant would eliminate existing repair and maintenance costs. Y – The cost of coal ash disposal would be eliminated.	Y – Power and heat generation via the new plant and supplemental purchase of electricity through a local utility provider would support mission requirements into the future. Y – Storage of fuel in the vicinity would meet the 14-day supply requirement for energy security.	Y – Operation of a modern plant with an upgraded distribution system would realize cost savings through energy efficiency and reduced repair and maintenance costs.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Construction and operation of modern heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would remain operational until the new plant is online. Y – The new plant would generate the required 45 MW of heat energy and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.
Alternative 3 Install Distributed Natural Gas Boilers	Y – Demolition of the existing CHPP and installation of distributed boilers would eliminate existing repair and maintenance costs. Y – The cost of coal ash disposal would be eliminated.	Y – Heat generation via the distributed boilers and all electrical power purchased through a local utility provider would support mission requirements into the future. Y – Storage of an emergency backup generator fuel source onsite and natural gas in the vicinity would meet the 14-day supply requirement for energy security.	Y – Operation of modern boilers would realize cost savings through energy efficiency, and repair and maintenance costs associated with CHPP would be eliminated.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Installation and operation of a modern heat generation system would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until the new system is online. Y – New boilers combined would generate the required 45 MW of heat energy annually. Y – Reliable power from a local utility provider would ensure provision of 19 MW of electrical capacity for mission requirements into the future.

Viability Analysis Alternative	**Screening Criteria**					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 4 Build New Oil-Fired CHPP	N – The new CHPP would require prohibitively expensive fuel source.	Y – Power and heat generation via the new plant and supplemental purchase of electricity through a local utility provider would support mission requirements into the future. Y – A fuel oil stockpile in the vicinity would meet the 14-day supply requirement for energy security.	N – The new CHPP would require a prohibitively expensive fuel source and would not have a foreseeable funding source.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Construction and operation of modern heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until the new plant is online. Y – The new plant would generate the required 45 MW of heat energy annually and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.
Alternative 5 Upgrade Existing CHPP and Convert to Gas or Oil Fuel	N – Natural gas would be required for operation of an upgraded plant and utilidor system. Utilizing gas to produce steam and then electricity would be prohibitively expensive. N – The conversion process from coal to fuel oil or gas is expensive.	Y – Power and heat generation via the upgraded system and supplemental purchase of electricity through a local utility provider would support mission requirements into the future. Y – A fuel stockpile in the vicinity would meet the 14-day supply requirement for energy security.	N – The CHPP upgrade would not have a foreseeable funding source.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Operation of upgraded heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until upgrades are online. Y – The upgraded plant would generate the required 45 MW of heat energy annually and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints 1	**Provides Compatibility with Mission and Energy Security Needs 2**	**Achieves Cost Efficiency with Funding Mechanism 3**	**Uses Adequate Technology for Subarctic Environment 4**	**Minimizes Environmental Impacts 5**	**Provides On-Installation Location with Minimized Disruption to Mission 6**
Alternative 6 Upgrade Existing CHPP to Heat Only and Convert to Gas or Oil Fuel	N – Continued maintenance and repair costs, following an upgrade with a minimum 40 percent heat efficiency in the plant and utilidors, would remain prohibitively expensive.	Y – Heat generation via the upgraded system and purchase of all electricity through a local utility provider would support mission requirements into the future. Y – A fuel stockpile in the vicinity would meet the 14-day supply requirement for energy security.	N –Based on a 40-year life cycle cost analysis, continuing with the existing CHPP, even if upgraded, would not be cost efficient.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Operation of upgraded heat system would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until upgrades are online. The upgraded plant would generate the required 45 MW of heat energy annually. Y – Reliable power from a local utility provider would ensure provision of 19 MW of electrical capacity for mission requirements into the future.
Alternative 7 Upgrade Existing CHPP and Convert to Biomass Fuel	N – The upgraded and converted CHPP would require a prohibitively expensive fuel source, with insufficient local fuel supply.	N –Stockpiling of a biomass fuel source would be difficult because of insufficient readily available and affordable quantities in the region.	Y – The CHPP upgrade would have a foreseeable funding source. N – The upgraded and converted CHPP would require prohibitively expensive fuel source.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Operation of upgraded heat and electrical generation systems would comply with federal and state environmental regulations.	Y – Existing CHPP would be operational until upgrades are online. Upgraded plant would generate the required 45 MW of heat energy annually. Y – Reliable power from a local utility provider would ensure provision of 19 MW electrical capacity for mission requirements into the future.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 8 Install Nuclear Power Generation	Y – Demolition of the existing CHPP and distribution system would remove associated repair and maintenance costs. N – Installing centralized electric steam boilers or upgrading electric feeders and installing building level electric boilers would be prohibitively expensive.	Y – Installation of nuclear power generation would support mission requirements into the future.	N – Nuclear power generation would not have foreseeable funding source. N – Because of the long licensing process and costs, nuclear power generation is not projected to be commercially viable for 10 to 20 years.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Operation of upgraded heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until upgrades are online. The new plant would generate the required 45 MW of heat energy annually and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 9 Install Wind Power Generation	Y – Demolition of the existing CHPP and distribution system would remove associated repair and maintenance costs. Y – Wind power generation would use a renewable energy source to self-generate electricity into the future. N – Installing centralized electric steam boilers or upgrading electric feeders and installing building level electric boilers would be prohibitively expensive.	N – The source supply of suitable wind energy would be limited in the Alaska interior region and would not have capacity to support the USAG Alaska mission requirements into the future. N – Siting and development of a new wind farm to support the installation would be infeasible.	N – Wind power generation would not have a foreseeable funding source. N – Investment to meet full installation heat and power requirements would be cost prohibitive. N – Installation of wind power generation would require construction and operation of large wind farm that could adequately supply electricity to the installation and retrofit of all facilities to electrical heating.	Y – The use of technology would be appropriate for subarctic conditions.	Y – The environmentally sustainable option would use renewable energy source to self-generate electrical needs into the future. Y – Next to no air emissions would result compared with air emissions from existing CHPP.	N – Wind power generation would not be located on the installation.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints 1	**Provides Compatibility with Mission and Energy Security Needs 2**	**Achieves Cost Efficiency with Funding Mechanism 3**	**Uses Adequate Technology for Subarctic Environment 4**	**Minimizes Environmental Impacts 5**	**Provides On-Installation Location with Minimized Disruption to Mission 6**
Alternative 10 Install Solar Power Generation	Y – Demolition of the existing CHPP and distribution system would remove associated repair and maintenance costs. Y – The renewable energy source would be used to self-generate electricity into the future.	N – Solar power generation would offer no immediate potential without substantial change in technology. N – Solar power generation would not provide sufficient electricity during winter months.	N – Solar power generation would not have a foreseeable funding source. N – Investment to meet full installation heat and power requirements would be cost prohibitive. N – Solar power generation would offer no immediate potential without substantial change in technology. N – Installation of solar power generation would require construction and operation of large solar farm that could adequately supply electricity to the installation and retrofit of all facilities to electrical heating.	N – Solar power generation would offer no immediate potential without substantial change in technology.	Y – The environmentally sustainable option would use renewable energy source to self-generate electrical needs into the future. Y – Air emissions would be substantially reduced compared with air emissions from existing CHPP.	N – Installation of solar power generation would require large land parcels for solar array. N – Solar power generation would be available only on-installation in areas used for military training.

Viability Analysis Alternative	**Screening Criteria**					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 11 Provide Heat from a Local Utility Provider	Y – Demolition of the existing CHPP and distribution system would remove associated repair and maintenance costs. N –Installing centralized electric steam boilers or upgrading electric feeders and installing building level electric boilers would be prohibitively expensive.	N – Energy security would be compromised because heat generation via electricity through a local utility provider is among the least economically favorable options.	N – Heat from the local utility provider would not have a foreseeable funding source. N –Retrofit of all facilities to electrical heating and upgrade to the installation's electrical infrastructure to meet demand would be prohibitively expensive.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Reliance on the electrical generation system would comply with appropriate federal and state regulations.	N – The existing CHPP would be operational until conversion is complete. The system would generate the required 45 MW of heat energy annually. N – Reliable power from a local utility provider would ensure provision of 19 MW of electrical capacity for mission requirements into the future, but require retrofit and upgrade to installation's electrical infrastructure.
Alternative 12 Construct a Coal Gasification Plant	Y – Demolition of the existing CHPP and construction and operation of a modern coal gasification plant would eliminate existing repair and maintenance costs.	Y – Power and heat generation via the new plant and supplemental purchase of electricity would support mission requirements into the future. Y – Storage of fuel in the vicinity would meet the 14-day supply requirement for energy security.	Y – Operation of a modern plant with an upgraded distribution system would realize cost savings through energy efficiency and reduced repair and maintenance costs.	N – The use of technology is still in the testing phases for subarctic conditions.	Y – Construction and operation of modern heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would remain operational until the new plant is online. Y –The new plant would generate the required 45 MW of heat energy and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints **1**	**Provides Compatibility with Mission and Energy Security Needs** **2**	**Achieves Cost Efficiency with Funding Mechanism** **3**	**Uses Adequate Technology for Subarctic Environment** **4**	**Minimizes Environmental Impacts** **5**	**Provides On-Installation Location with Minimized Disruption to Mission** **6**
Alternative 13 Construct a Methane Capture Facility	N – The methane capture facility would require a fuel source, with insufficient local or regional supply.	N – Stockpiling of the fuel source would be difficult because of insufficient regional resources.	N – The CHPP would not have a foreseeable funding source.	N – The use of technology has not been proven for use in subarctic conditions.	Y – Operation of heat and electrical generation systems would comply with federal and state environmental regulations.	Y – The existing CHPP would be operational until upgrades are online. The upgraded plant would generate the required 45 MW of heat energy annually. Y – Reliable power from a local utility provider would ensure provision of 19 MW of electrical capacity for mission requirements into the future.
Alternative 14 Construct River Turbines	N – The river turbines would be prohibitively expensive to construct and operate at the scale required.	N – The river turbines would not provide a secure energy source.	N – The CHPP would not have a foreseeable funding source.	N – The use of technology has not been proven for use in subarctic conditions.	Y – Installation and operation of the system would comply with federal and state environmental regulations.	N – Power generation would not be located on the installation.

Viability Analysis Alternative	Screening Criteria					
	Addresses Current Cost Constraints 1	**Provides Compatibility with Mission and Energy Security Needs 2**	**Achieves Cost Efficiency with Funding Mechanism 3**	**Uses Adequate Technology for Subarctic Environment 4**	**Minimizes Environmental Impacts 5**	**Provides On-Installation Location with Minimized Disruption to Mission 6**
Alternative 15 Construct Two CHPPs	N – The two CHPPs would be prohibitively expensive to construct and operate.	Y – Installation of two CHPPs would support mission requirements into the future.	N – The construction and operation of two CHPPs would not recognize any cost savings.	Y – The use of technology would be appropriate for subarctic conditions.	Y – Installation and operation of the system would comply with federal and state environmental regulations	Y –The existing CHPP would remain operational until the new plant is online. Y –The new plant would generate the required 45 MW of heat energy and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.
Alternative 16 Incinerate Pelletized Recycled Paper and Cardboard	N –The incineration would be prohibitively expensive to construct and operate at the scale required.	N – The addition of incineration would not provide a secure energy source.	N – The CHPP would not have a foreseeable funding source.	N – The use of technology at the scale required has not been proven for use in subarctic conditions.	Y – Installation and operation the system would comply with federal and state environmental regulations	Y –The existing CHPP would remain operational until the new plant is online. Y –The new plant would generate the required 45 MW of heat energy annually and ensure reliable provision of 19 MW of electrical capacity for mission requirements into the future.

Notes:

Sources: Guernsey 2015, USACE 2018

MW – megawatt

"Y –" indicates that the alternative meets the screening criterion, and gray shading with "N –" indicates that the alternative does not meet the criterion.

2.4 Alternatives Considered but Eliminated from Further Consideration

The following alternatives were eliminated from further consideration because they did not meet one or more of the screening criteria:

- **Alternative 4: Build New Oil-Fired CHPP.** Under this alternative, a new CHPP would be constructed and the existing CHPP would be demolished. The fuel source for producing both heat and electricity would be solely ultra-low-sulfur diesel (ULSD) fuel oil. USAG Alaska would purchase a sustained supply of oil and install an onsite fuel storage tank for emergencies. Although the elimination of burning coal would reduce ash disposal costs and a new CHPP would increase energy efficiency, generating power and heat under this model would be cost prohibitive as a primary fuel source because the cost of ULSD fuel oil is on average three times the cost of coal. This alternative would be cost prohibitive, does not meet Screening Criteria 1 and 3, and has been eliminated from further consideration in this EIS.
- **Alternative 5: Upgrade Existing CHPP and Convert to Gas or Oil Fuel.** Under this alternative, USAG Alaska would upgrade the existing CHPP and distribution system to enable use of natural gas or oil as the primary fuel source instead of coal. USAG Alaska would purchase a sustained supply of gas or oil and install an onsite fuel storage tank for emergencies. Renovation of the existing plant would include removal of asbestos and polychlorinated biphenyls (PCBs). New pipelines to transport fuel to the plant would be constructed. The existing plant would be updated and retrofitted with modern technologies and system connections to accommodate an inflow and use of the new fuel source. Additionally, the emissions stacks would have to be updated to incorporate use of modern air quality scrubbers to meet air quality standards. The costs for maintenance and repair of the existing plant would continue despite the upgrades. The low efficiency of heat lost during generation and distribution would also continue. In addition, oil fuel is a prohibitively expensive fuel source. Therefore, this alternative would be cost prohibitive, does not meet Screening Criteria 1 and 3, and has been eliminated from further consideration in this EIS.
- **Alternative 6: Upgrade Existing CHPP to Heat Only and Convert to Gas or Oil Fuel.** Under this alternative, USAG Alaska would upgrade and convert the existing CHPP to a heat plant and would purchase electricity for Fort Wainwright from a local utility provider. This alternative, which is otherwise similar to Alternative 5, would be cost prohibitive, does not meet Screening Criteria 1 and 3, and has been eliminated from further consideration in this EIS.
- **Alternative 7: Upgrade Existing CHPP and Convert to Biomass Fuel.** Under this alternative, the CHPP would be converted from a coal-fired plant to a biomass fuel combustion plant. As with the other upgrade alternatives described above, renovation of the existing plant would include removal of asbestos and PCBs. USAG Alaska would purchase a sustained supply of biomass fuel to meet the heat and energy needs of the installation. Biomass resources and suppliers in the

Alaskan interior have been found to be scarce and insufficient to meet power requirements (DOE 2009), however, and acquiring biomass fuel otherwise would be cost prohibitive. Because biomass fuel availability is not reliable or cost effective, this alternative does not meet Screening Criteria 1, 2, and 3 and has been eliminated from further consideration in this EIS.

- **Alternative 8: Install Nuclear Power Generation.** Under this alternative, USAG Alaska would construct and operate a small, modular, prototype nuclear reactor to generate power. Conversion of the power to heat at a capacity that would be usable by facilities on the installation would require substantial overhaul of much of the installation's electrical distribution system. Additionally, every facility would be converted from steam infrastructure to use of an electrical heat supply. Generating power and heat under this alternative would also present substantial technological limitations at the scale required. There are currently no commercially viable options at this scale for nuclear power. Technology for using nuclear energy on a small commercial level is still in developmental phases and is not anticipated to be viable for another 10 to 20 years (USACE 2018). Even if the technology was more readily available, the sequential processes for site permitting, design certification, construction (estimated at up to 10 years), and licensing processes (estimated at a minimum 6 years based on the timeline for relicensing) (World Nuclear Association [WNA] 2019) would be prohibitively time-intensive to meet USAG Alaska's need to have a reliable, operational facility by approximately 2026 and would also be cost-prohibitive. Therefore, this alternative does not meet Screening Criteria 1 and 3 and has been eliminated from further consideration in this EIS.
- **Alternative 9: Install Wind Power Generation.** Under this alternative, the existing CHPP would be demolished upon completion of a wind power project that would provide all the energy required to heat and power the installation. The wind resource in the Fort Wainwright region, however, is not sufficient to support a wind energy project (DOE 2009). This alternative would require construction and operation of a wind farm off the installation that could adequately supply electricity to Fort Wainwright and require retrofit of all facilities to electric heating, which has been determined to be cost prohibitive. For these reasons, this alternative does not meet Screening Criteria 1, 2, 3, and 6 and has been eliminated from further consideration in this EIS.
- **Alternative 10: Install Solar Power Generation.** Under this alternative, heat and power for the installation would be generated from a solar energy system. The existing CHPP would be demolished upon completion of the solar project. This alternative would require construction and operation of a solar energy system sufficient to produce adequate electricity to all of Fort Wainwright and would require retrofit of all facilities to electric heating. In Alaska's combined extreme cold weather and solar ecliptic range, which preclude sufficient energy collection in winter, conversion to a solar energy system poses risks to energy security. The solar energy system would require large areas of land to be used. If on-post, the only large areas of land that would be supportive of solar energy are those used for military training activities. There is also no reliable solar technology currently

available to meet the energy needs of the installation without risking the mission (DOE 2009). For these reasons, this alternative does not meet Screening Criteria 2, 3, 4, and 6 and has been eliminated from further consideration in this EIS.

- **Alternative 11: Provide Heat from a Local Utility Provider.** Under this alternative, decentralized electrical heat would replace the CHPP. The existing CHPP would be demolished once installation facilities have been retrofitted with electric heating units. All electricity would be purchased from a local utility provider, a source that is highly reliable and now more affordable than self-generated electricity (USACE 2018), but a distributed electric resistance heating solution is among the least economically favorable options and therefore an insecure long-term solution (Guernsey 2015). Because of transmission losses, electric heat is more expensive than heat produced from combustion appliances such as natural gas or oil boilers. In addition, the retrofit to decentralize the electric heat sources would be prohibitively expensive and would not meet Screening Criterion 1. This alternative does not meet Screening Criterion 2 because of its inability to provide adequate energy security, does not meet Screening Criteria 3 and 6 because of cost inefficiencies, and has been eliminated from further consideration in this EIS.
- **Alternatives 12-16**: **Additional Alternatives Identified During Scoping**. Alternatives identified during the EIS scoping process included a coal gasification plant, methane capture facility, in-water current turbines, two separate CHPPs on the installation, and incineration of recycled paper to generate energy. Consideration of each of these alternatives against the screening criteria presented in Section 2.3 determined that none would meet all six criteria. Limitations of the suggested alternatives included methods that would not provide a stable and proven technology suitable for a subarctic climate, be economically viable, use a reliable fuel source, or meet more than a fraction of the installation's electricity demand. Therefore, these alternatives were eliminated from further consideration in this EIS.

2.5 Alternatives Carried Forward for Analysis

This section presents the range of alternatives carried forward for detailed analysis in this EIS. Although a No Action Alternative would not meet the purpose of and need for the Proposed Action, this alternative provides a baseline comparison for the Proposed Action and alternatives, in accordance with 40 CFR Part 1502. As demonstrated in Table 2.3-1, Alternatives 1, 2, and 3 meet all screening criteria and are each assumed to be able to provide a modern, reliable, operational facility within the Army's current target date of 2026. USAG Alaska has not identified a preferred alternative in this Draft EIS.

2.5.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. USAG Alaska would continue to use the existing CHPP and utilidor system described in Section 1.1.2 and would not construct any new facilities. Continued reliance on this antiquated electrical and heat infrastructure system would result in operational and cost inefficiencies, life-safety hazards, and risks to mission sustainability at Fort Wainwright. The existing system operates at about 42 percent efficiency because about 60 percent of fuel energy is lost by the time coal energy is converted to either usable steam energy or useful electricity (Guernsey 2015). To keep the plant operational, USAG Alaska would need to make major repairs and upgrade plant parts and technologies, upgrade approximately 27 miles of antiquated utilidor pipeline, incorporate cost-intensive BACT (implementation costs estimated between $22 million and $235 million [Agrawal 2020]), and continue to operate the CHPP boilers at 20 percent reduced capacity to meet air quality emissions regulations and standards. Under the No Action Alternative, the System Owner contractor would continue to invest money in the infrastructure as originally proposed in the contract. This capital investment would allow the System Owner contractor to earn interest on its investment, which is the profit it expected when the contract was executed in 2008.

Continuing to operate the existing CHPP at reduced capacity would diminish the existing plant's ability to support the USAG Alaska and USARAK missions.

Figure 2.5-1 illustrates the No Action Alternative.

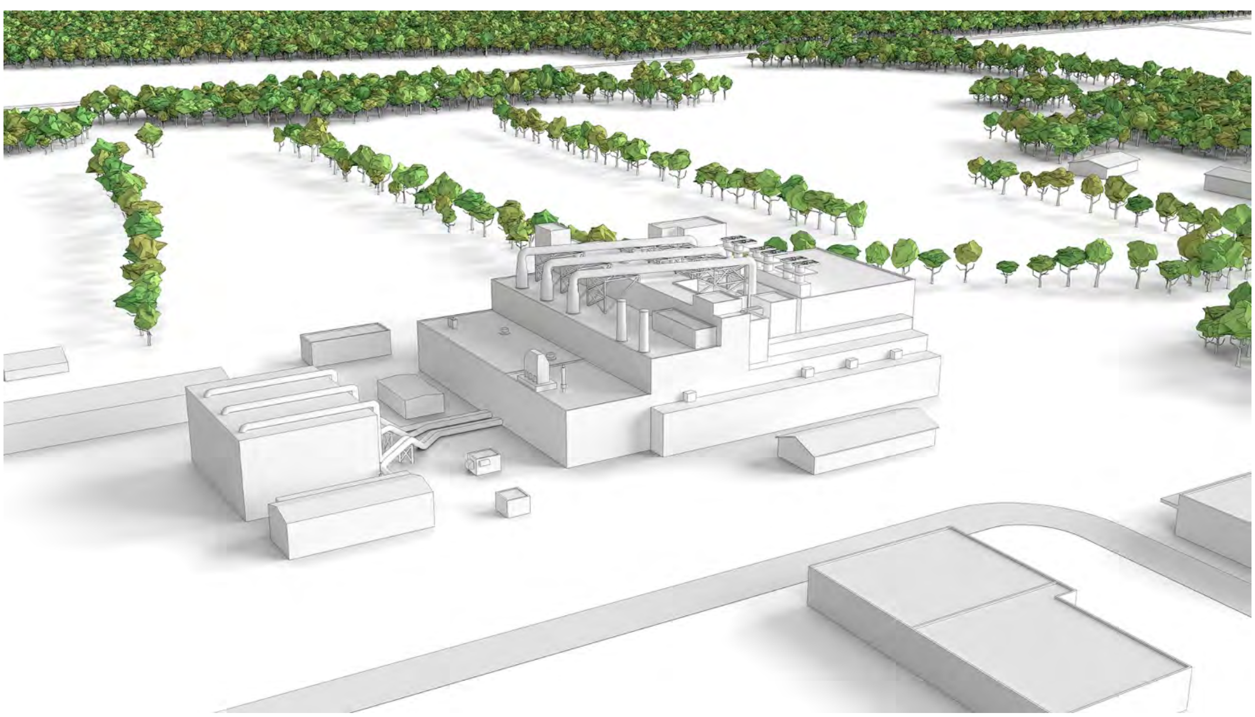

Figure 2.5-1. No Action Alternative

2.5.2 Alternative 1: Build a New Coal CHPP

Alternative 1 would involve construction of a new, modern, coal-fired CHPP and upgrades to the steam distribution system to replace the existing coal-fired CHPP by the Army's target date of approximately 2026. This alternative would ensure sustained operations and minimized impacts on USAG Alaska's mission. USAG Alaska would continue to operate the existing plant until construction of the new CHPP and until supporting infrastructure is completed and facilities are online. USAG Alaska would demolish the old CHPP following operational transition. The location of the new plant would be in the vicinity of the existing plant to maximize continued use of the existing utilidors, which would be renovated and connected to the upgraded steam distribution system. Under Alternative 1, although not explicitly required in the UPC, it's plausible that the Army would utilize the existing UPC to construct a new, modern, coal-fired CHPP. In this scenario, the System Owner would invest substantially more money in the utility system than in its original proposal. Therefore, the System Owner's net profit would be substantially higher than originally projected in 2007 (Guernsey 2015, USACE 2018).

Coal would continue to be the fuel source and would be stockpiled onsite. Coal ash would continue to be disposed of at the permitted landfill located at Fort Wainwright. Operation of the new CHPP as a cogeneration plant would continue to generate electricity and heat simultaneously into the future. The new plant would be capable of producing 45 MW of heat energy. Any additional electricity requirements would be purchased directly from a local utility provider. Through the use of modern technology adequate for operation in subarctic conditions, the new system would be assumed to be capable of meeting federal and state environmental regulations and meeting air quality standards for the region. Based on the heat and electricity studies described in Section 1.1.2**,** among the alternatives carried forward for detailed analysis in the EIS, this alternative was projected to have the highest implementation and O&M costs and the highest risk for installation-wide loss of heat through distribution (USACE 2018).

Figure 2.5-2 illustrates the Alternative 1 concept. Figure 2.5-3 shows the CHPP location proposed under Alternatives 1 and 2.

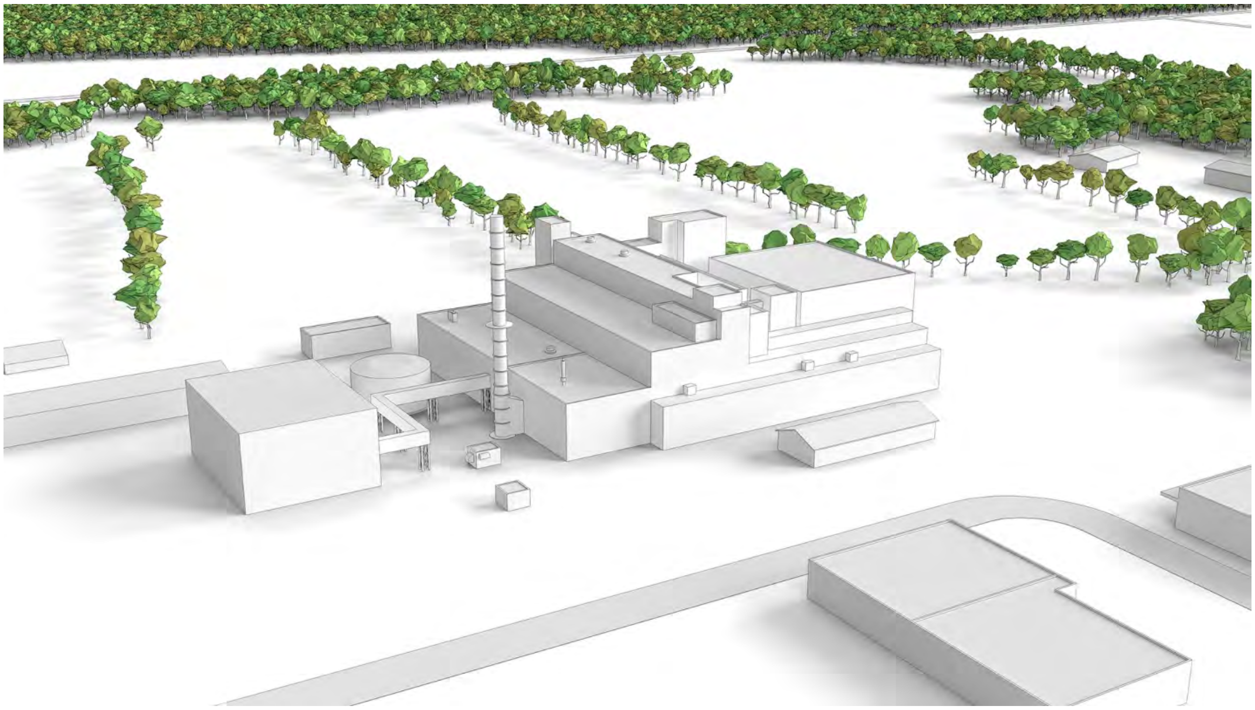

Figure 2.5-2. Alternative 1 Concept

Figure 2.5-3. Proposed CHPP Location for Alternatives 1 and 2

2.5.3 Alternative 2: Build New Dual-Fuel Combustion Turbine Generator CHPP

Alternative 2 would involve replacement of the existing CHPP with a new, modern, dual-fuel combustion turbine generator CHPP. A combustion turbine generator would convert natural gas or other liquid fuels to mechanical energy. The system would use three 7-MW gas turbine generators, with three supplemental, duct-fired, heat recovery steam generators (HRSGs) that have a capacity of 200 kilo-pounds per hour (Guernsey 2015, USACE 2018). This configuration allows for two online combustion turbine generators to meet peak demands while one is down for maintenance and two of the HRSGs to meet peak steam-to-post demands, leaving one for redundancy. The primary fuel for the new plant would be natural gas, with ULSD as the secondary source. As described for Alternative 1, USAG Alaska would continue operation of the existing plant until construction of the new CHPP and supporting infrastructure is completed and facilities are online to ensure sustained training and minimized impacts on the USAG mission. Under Alternative 2, although not explicitly required in the UPC, it's plausible that the Army would utilize the existing UPC to construct a new, modern, dual-fuel combustion turbine generator CHPP. In this scenario, the System Owner would invest more money in the utility system than in its original proposal. Therefore, its net profit would be much higher than originally projected in 2007 (Guernsey 2015, USACE 2018). USAG Alaska would demolish the old CHPP following new construction.

It is assumed that the new plant would be capable of producing 45 MW of heat energy and would operate as a cogeneration plant in which the plant operates to follow the electricity load and any additional electricity would be purchased directly from a local utility provider. The new CHPP would be located near the existing CHPP and the upgraded steam distribution system. Under this alternative, USAG Alaska would be required to secure a sustained supply of natural gas or ULSD. It has been demonstrated that the availability of natural gas in Alaska is sufficient to meet the installation's demand (Pentex Alaska LLC 2016). Natural gas or ULSD would be sourced from a utility provider, natural gas would be supplied by a pipeline to the installation, and ULSD would be stored in aboveground tanks located on the installation. Additionally, in accordance with Army Directive 2017-07, this alternative would ensure the provision of fuel storage to maintain a minimum 14-day supply adequate to support facility operations in the event of a substantial energy supply disruption. Through the use of modern technology adequate for operation in subarctic conditions, the new system would be assumed capable of meeting federal and state environmental regulations and meeting air quality standards for the region. Based on the heat and electricity studies described in Section 1.1.2, among the alternatives carried forward for detailed analysis in the EIS, this alternative was determined to have enhanced fuel source resiliency and lower implementation and O&M costs than a coal-fired CHPP, and to be the least environmentally impactful centralized heat and power option (USACE 2018).

Figure 2.5-4 illustrates the Alternative 2 concept.

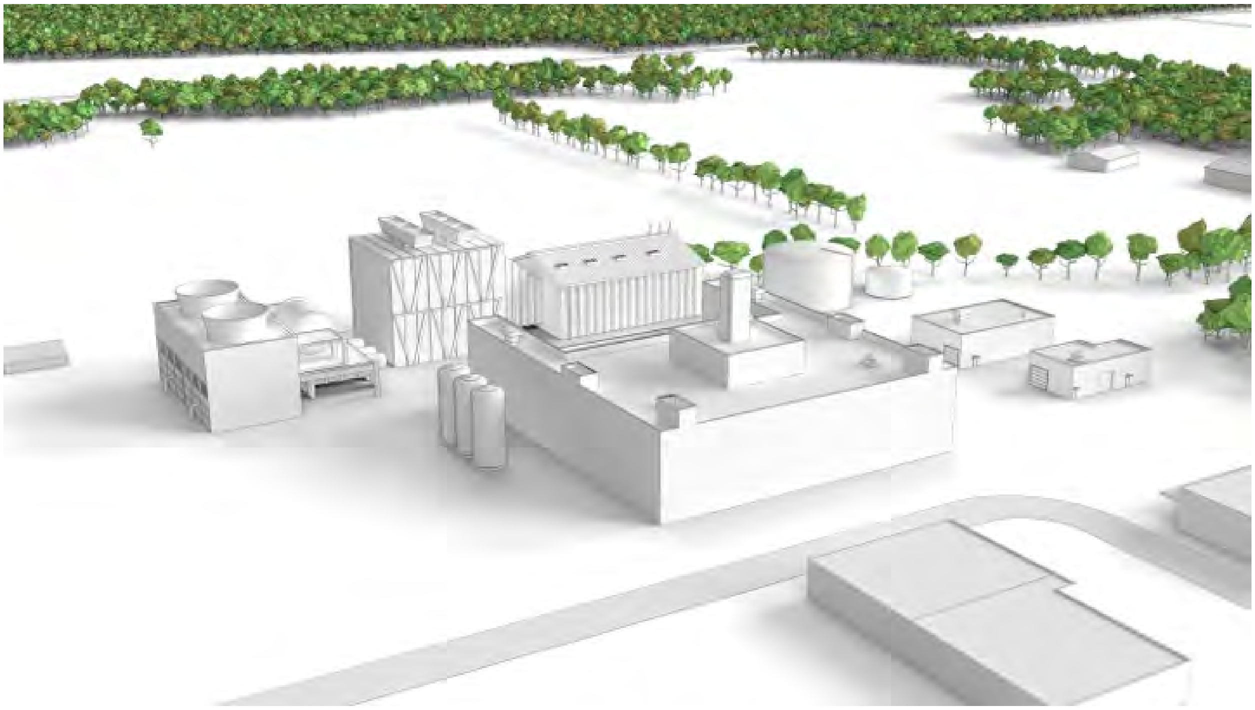

Figure 2.5-4. Alternative 2 Concept

2.5.4 Alternative 3: Install Distributed Natural Gas Boilers

Under Alternative 3, USAG Alaska would transition away from reliance upon a centralized heat and power model. Instead, USAG Alaska would install multiple high-efficiency natural gas-fired boilers that would be dispersed at facilities across the installation to provide heat, and would purchase all required electricity from a local utility provider (Guernsey 2015, USACE 2018). As described for Alternatives 1 and 2, USAG Alaska would continue operation of the existing plant until installation of the new natural gas boilers and construction of the supporting infrastructure is completed and facilities are online, to ensure minimal impacts on the USAG Alaska mission. USAG Alaska would demolish the old CHPP once construction of the distributed natural gas boiler system is complete. The installation of individual boilers may be executed under the UPC by the System Owner, through a Utilities Energy Service Contract (UESC) or by competitive bid. Under Alternative 3, the System Owner would still invest more money in the utility system whether it installs the distributed boilers than if it does not. The capital investment would be larger if the System Owner does install the distributed boilers. Therefore, the System Owner's net profit would still be more with or without this project than it was originally projected in 2007 (Guernsey 2015, USACE 2018).

The existing steam distribution system would be upgraded as required to accommodate steam and return water distribution to support the boilers and other underground utilities such as water and sewer pipes. As described for Alternative 2, USAG Alaska would also purchase a sustained supply of natural gas to support boiler operations across the installation. As described for Alternative 2, natural gas or ULSD would be sourced from a utility provider, natural gas would be supplied by a pipeline to the installation, and ULSD would be stored in aboveground tanks located on the installation. In the event of a power outage or natural gas interruption to mission-critical buildings, ULSD-reciprocating internal combustion generators would be used as emergency backup power or heat sources for boilers. To provide installation-wide electricity resiliency, generators would be placed at electrical substations in the event of a local utility-provided power interruption. Through the use of modern technology adequate for operation in subarctic conditions, the new system would meet federal and state environmental regulations and meet air quality standards for the region. Based on the heat and electricity studies described in Section 1.1.2, among the alternatives carried forward for detailed analysis in the EIS, this alternative resulted in the lowest implementation and O&M costs, the highest increase in energy efficiency, and the advantage of emergency generators already in place in mission-critical facilities (USACE 2018)

Figure 2.5-5 illustrates the Alternative 3 concept. The proposed project area for Alternative 3 is shown in Figure 2.5-6.

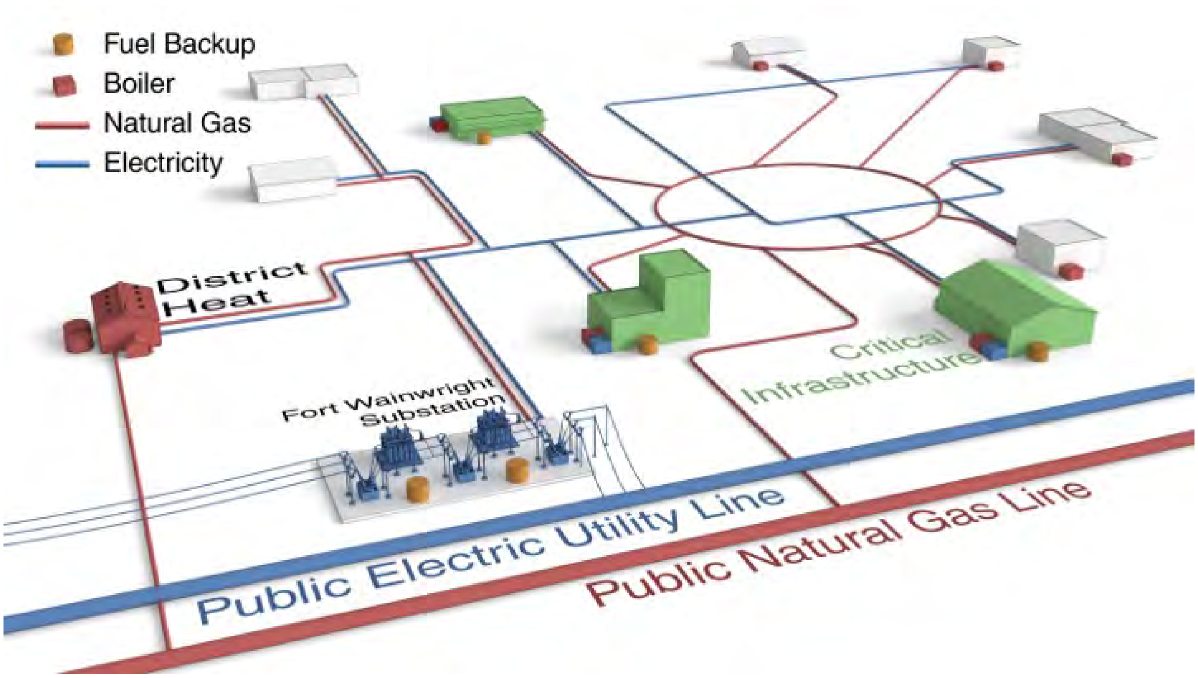

Figure 2.5-5. Alternative 3 Concept

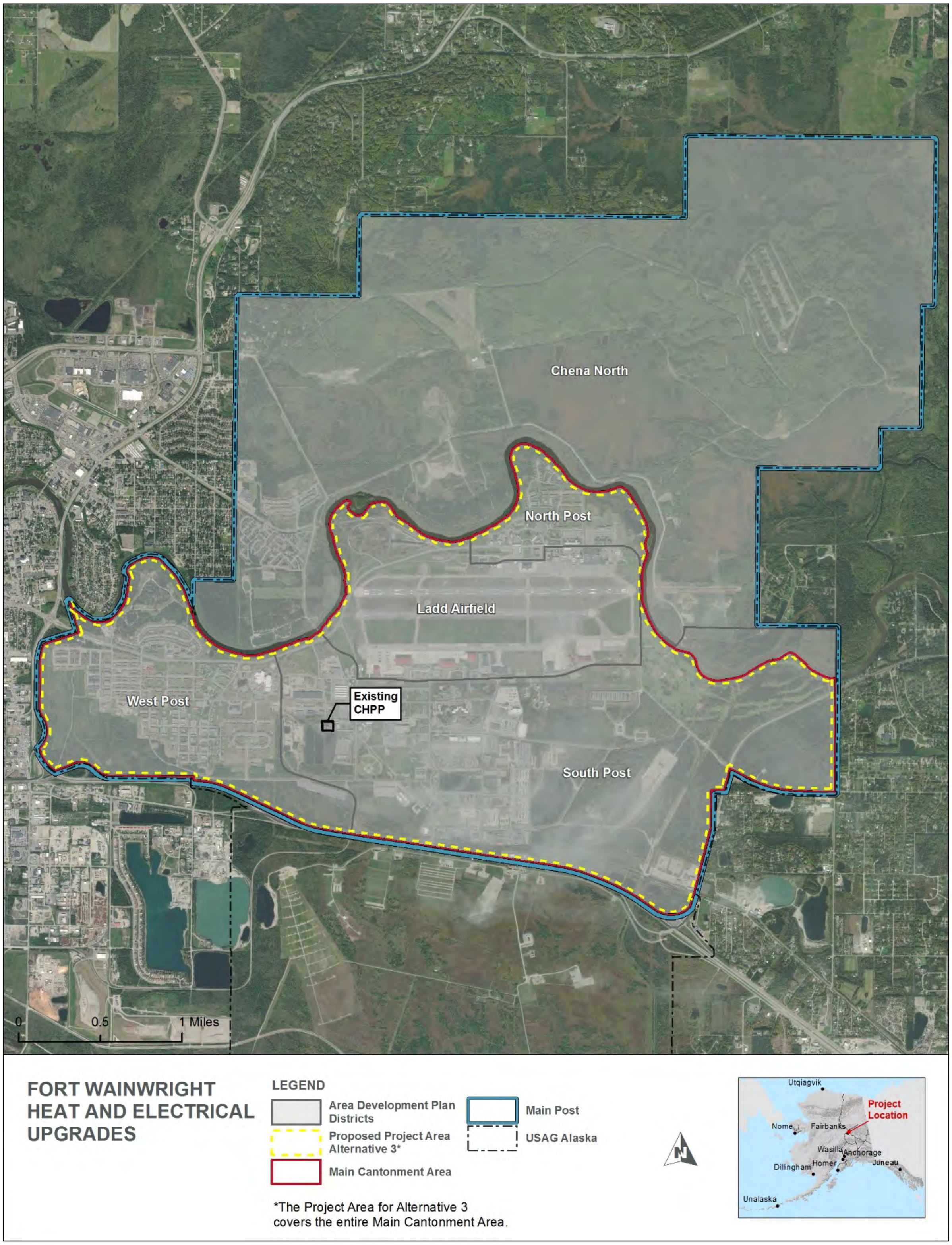

Figure 2.5-6. Proposed Project Area, Alternative 3

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3. Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the affected environment of Fort Wainwright and the surrounding area, as well as the direct, indirect, and cumulative environmental impacts associated with each alternative. The affected environment consists of areas and the resources within those areas that may experience environmental effects resulting from implementing the alternatives described in Chapter 2. A region of influence (ROI) is described for each resource area examined in this analysis. The ROI varies among resource areas and defines the geographic extent of potential effects from the alternatives on the important elements of that resource. Immediately following the Affected Environment section for each resource is the presentation of the Environmental Consequences section, which describes the environmental impacts associated with each alternative. Alternatives are discussed in the following order, with the three action alternatives all including the demolition and removal of the existing CHPP:

- No Action Alternative, in which the Proposed Action would not be implemented
- Alternative 1, Build a New Coal CHPP, which would involve construction of a new, modern, coal-fired CHPP and upgrades to the steam distribution system
- Alternative 2, Build New Dual-Fuel Combustion Turbine Generator CHPP, which would consist of replacing the existing CHPP with a new, modern, dual-fuel combustion turbine generator CHPP with HRSGs.
- Alternative 3, Install Distributed Natural Gas Boilers, which would consist of installing multiple high-efficiency natural gas-fired boilers at facilities across the installation to provide heat and purchasing of all required electricity from a local utility provider

The Environmental Consequences section for each resource topic also identifies mitigation measures to reduce or eliminate the impacts of an alternative on a resource, and a summary is provided in Section 3.16. The cumulative impacts of the alternatives with other past, present, and reasonably foreseeable future actions within the ROI for each resource area are discussed in Section 3.16. As required by 40 CFR § 1502.16, this chapter also describes, in Section 3.16, a summary of environmental impacts from the Proposed Action and alternatives, adverse environmental effects that cannot be avoided, compatibility with land use plans, irreversible or irretrievable commitments of resources, and the relationship between short-term uses of the environment and long-term productivity.

3.1.1 Impacts Analysis

Analysis of the environmental consequences of the Proposed Action focuses on those areas of concern identified during scoping as well as environmental consequences that are inherent to the Proposed Action. Direct effects are those caused by the action and that occur at the same time and place, whereas indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR § 1508.8). For example, impacts from the demolition of the existing CHPP at Fort Wainwright would be a direct effect associated with Alternatives 1, 2, and 3, and an increase in local spending by construction workers hired to perform the demolition would be an indirect effect. Impacts are characterized as beneficial or adverse and short term or long term. Beneficial impacts are those that would result in a positive change in the condition or appearance of the resource or a change that would move the resource toward a desired condition. Adverse impacts are those that would result in a negative change to the appearance or condition of the resource. Short-term impacts are those that would be temporary and associated with the demolition/construction phase but would no longer occur once demolition/construction is completed or shortly thereafter. Long-term impacts are those that would be permanent or would persist for the operational life of the project.

Impact Characterizations. Qualitative terms used to assess the anticipated impacts associated with each alternative are generally defined as presented below. These terms are further adapted to address the unique characteristics of each resource category carried forward for analysis in this chapter. Impacts are characterized with respect to intensity, ranging from no impacts to significant impacts, and whether the impacts would be adverse or beneficial.

- **None** – No measurable impacts are expected to occur.
- **Negligible** – Barely perceptible impacts are expected to occur.
- **Minor** – Measurable impacts on a resource are expected, but would be slight and may not be perceptible to an observer.
- **Moderate** – Noticeable impacts expected to have a measurable effect on the resource but would be less than significant.
- **Significant** – Impacts would be obvious and would have serious consequences on the resource that would be readily noticed by an observer.
- **Adverse** – Impacts would reduce the quality of the resource/issue.
- **Beneficial** – Impacts would improve the resource/issue.

Significant Impacts. The significance of an impact is determined by the intensity and the context of the impact. Intensity refers to the severity or extent of an impact (i.e., none, negligible, minor, moderate, or significant) and context relates to the environmental circumstances at the location of the impact. Significance criteria were developed in consideration of CEQ’s guidance for determining significance (40 CFR § 1508.27). For this analysis, the first four qualitative impact categories (none, negligible, minor, and moderate) are considered not significant. The “none, negligible, minor, and moderate” qualitative impact categories could be a result of avoidance, minimization, or mitigation of adverse impacts. The significance criteria are described for each resource area at the beginning of each Environmental Consequences section. The terms *impact* and *effect* are interchangeable.

Avoidance, Minimization, and Mitigation Measures. USAG Alaska is committed to avoiding or mitigating adverse effects to the extent practical. Mitigation measures can include the following (40 CFR § 1508.20):

- Avoiding the impact altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments

USAG Alaska would implement the following types of measures to avoid, minimize, and/or mitigate adverse impacts on environmental resources:

- *Design measures* – Project design components incorporated into the design of action alternatives with the goal of avoiding or minimizing anticipated less-than-significant impacts on environmental resources. Design measures for each resource area discussed below identify the avoidance and minimization measures that would be incorporated into the project design to avoid or reduce impacts on environmental resources within the proposed project area.
- *Construction measures* – Avoidance and minimization measures that would be incorporated before, during, and after construction to reduce anticipated less-than-significant impacts that would result from constructing an action alternative.
- *Best management practices (BMPs)* – Practices or protocols that are intended to maintain compliance with regulatory standards and, when implemented, are proven to reduce impacts on a resource. BMPs that would be implemented as part of an action alternative are listed under design and construction measures, as appropriate.
- *Mitigation measures* – Where specified, these measures would be implemented to reduce anticipated significant impacts (in accordance with NEPA) and/or to offset or compensate for unavoidable adverse impacts on a resource.

A summary of potential measures for each resource area is presented in Section 3.16.

3.1.2 Resource Areas Carried Forward for Analysis

In consideration of the anticipated effects associated with the proposed alternatives, the following resource areas were carried forward for detailed analysis in this EIS:

- Air Quality

- Utilities
- Hazardous and Toxic Materials and Wastes
- Socioeconomics
- Environmental Justice
- Noise
- Land Use
- Transportation and Traffic
- Human Health and Safety
- Geology and Soil Resources
- Water Resources
- Cultural Resources
- Airspace

3.1.3 Resource Areas Dismissed from Further Analysis

After considering information gathered during the internal and public scoping processes, factors used to evaluate the context and intensity of the potential impacts, and the anticipated impacts associated with the proposed alternatives, it was determined that electromagnetic spectrum and biological resources would not experience a measurable impact as a result of the alternatives contained in this analysis.

The electromagnetic spectrum is the span of all electromagnetic radiation and consists of many sub-ranges, such as visible light, ultraviolet light, radio waves, and infrared waves, which are important to a wide variety of devices such as radio and cellular communications, radar, navigation systems, data transfer systems, and other important applications. The construction of a new CHPP or distributed heating system at Fort Wainwright would be required to use commercially available technologies that are licensed and regulated by the Federal Communication Commission and National Telecommunications and Information Administration. Therefore, an impact on the electromagnetic spectrum would be avoided.

Biological resources generally refers to native and non-native plant and animal species and the habitats used by those species. There are currently no federally listed threatened or endangered plant or animal species known or expected to occur on Fort Wainwright lands (U.S. Fish and Wildlife Service [USFWS] 2019; USAG Fort Wainwright 2013b, 2019). The Fort Wainwright Main Post supports a variety of wetland types (USAG Fort Wainwright 2013b), but no impacts on wetlands are expected. The construction of a new CHPP or distributed heating system at Fort Wainwright would require some vegetation be cleared, however, most vegetation within these areas has already been disturbed. To the extent practical, the Army would avoid siting ground-disturbing activities in high functioning habitats, such as riparian areas or those containing rare or sensitive plant or animal species. Although some birds and other wildlife may use affected habitats, the Army would maintain compliance with appropriate regulations to avoid impacts. Therefore, potential adverse impacts on wildlife, wetlands, and vegetation would be negligible at most.

3.2 Air Quality

3.2.1 Affected Environment

The ROI for air quality resources is the Northern Alaska Intrastate Air Quality Control Region (AQCR).

3.2.1.1 Definition of Resource

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life or to property, or to interfere unreasonably with the comfortable enjoyment of life and property (Alaska Statute 46.03.900[2]). Air quality as a resource incorporates several components that describe the levels of overall air pollution within a region, sources of air emissions, and regulations governing air emissions. The National Ambient Air Quality Standards (NAAQS), local ambient air quality, and the air quality requirements for stationary sources in the Fairbanks area are discussed below.

3.2.1.2 Environmental Laws, Regulations, and Executive Orders

The EPA Region 10 and ADEC regulate air quality in Alaska. The CAA (42 U.S.C. §§ 7401–7671q), as amended, gives EPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for six criteria pollutants: PM (i.e., PM smaller than 10 microns in diameter [PM_{10}] and $PM_{2.5}$), sulfur dioxide (SO_2), CO, nitrogen dioxide (NO_2), ozone (O_3), and lead. Short-term standards (i.e., 1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, and long-term standards (i.e., annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards stricter than those established under the federal program. The State of Alaska accepts the federal standards, with the following additions:

- ADEC's current rules contain EPA's previous 24-hour SO_2 standard of 0.14 parts per million (ppm) (365 micrograms per cubic meter [$\mu g/m^3$]).
- ADEC's current rules contain EPA's previous annual SO_2 standard of 0.03 ppm (80 $\mu g/m^3$).
- ADEC has an 8-hour ammonia standard of 2.1 milligrams per cubic meter.

Federal regulations designate geographic areas that have concentrations of a criteria pollutant that exceed the NAAQS as a *nonattainment* area for that pollutant. Federal regulations designate areas with pollutant levels below the NAAQS as *attainment* areas. *Maintenance* areas are areas that have previously been designated nonattainment and have been redesignated to attainment for a probationary period through implementation of maintenance plans. According to the severity of the pollution problem, nonattainment areas for O_3 can be categorized as marginal, moderate, serious, severe, or extreme. PM_{10} and $PM_{2.5}$ nonattainment areas are designated as either moderate or serious.

Nonattainment areas for all other criteria pollutants have no classification level. Fairbanks is within the FNSB portion of the Northern Alaska Interstate AQCR, or AQCR 09 (40 CFR § 81.246). EPA has designated the FNSB portion of AQCR 09 as the following (40 CFR § 81.302):

- Serious nonattainment for the $PM_{2.5}$ NAAQS
- Maintenance for the CO NAAQS
- Attainment for all other criteria pollutants

Figure 3.2-1 shows the FNSB CO maintenance area and the serious nonattainment area for $PM_{2.5}$.

Since 1990, Alaska has developed a core of air quality regulations that have been approved by the EPA. These approvals signified the development of the general requirements of the Alaska State Implementation Plan (SIP) for attaining the NAAQS. The Alaska program for regulation of air emissions affects industrial sources, commercial facilities, and residential development activities. Regulation occurs primarily through a process of reviewing engineering documents and other technical information, applying emissions standards and regulations in the issuance of permits, performing field inspections, and assisting industries in determining their compliance status with applicable requirements.

The CAA [at 42 U.S.C. § 7472(a)] defines mandatory Class I federal areas as certain national parks, wilderness areas, national memorial parks, and international parks that were in existence as of August 1977. Four Class I areas are located in the State of Alaska, with Denali National Park and Preserve being the closest. The closest point on the boundary of the Denali National Park and Preserve Class I area is located approximately 78 miles (126 kilometers) south-southwest of Fort Wainwright Main Post (Figure 3.2-2).

Regional Haze – Second Implementation Period

As of June 2020, ADEC is developing revisions to the SIP to address the second implementation period of EPA's Regional Haze Rule. EPA published guidance for states in a memorandum (EPA 2019a). The methodology that ADEC will use to determine the stationary sources that will be included in the revised SIP has not been finalized. One simple evaluation surrogate metric that can be used is the Q/d method, which divides emissions in tons per year (tpy) by the distance to the affected Class I area in kilometers. Preliminary information provided by ADEC indicates that sources with a Q/d value of 10 or greater would be included in the revised SIP. However, this value threshold (if ADEC uses the Q/d methodology) may increase or decrease as the SIP is developed.

The direct and precursor pollutants that can impair visibility include SO_2, NO_x, fine and coarse PM, volatile organic compounds (VOCs), and ammonia. Use of the Q/d method can be refined to account for different impacts of the various PM species and precursors. For purposes of this analysis, the Q/d evaluation will be based on the sum of all these direct and precursor pollutants.

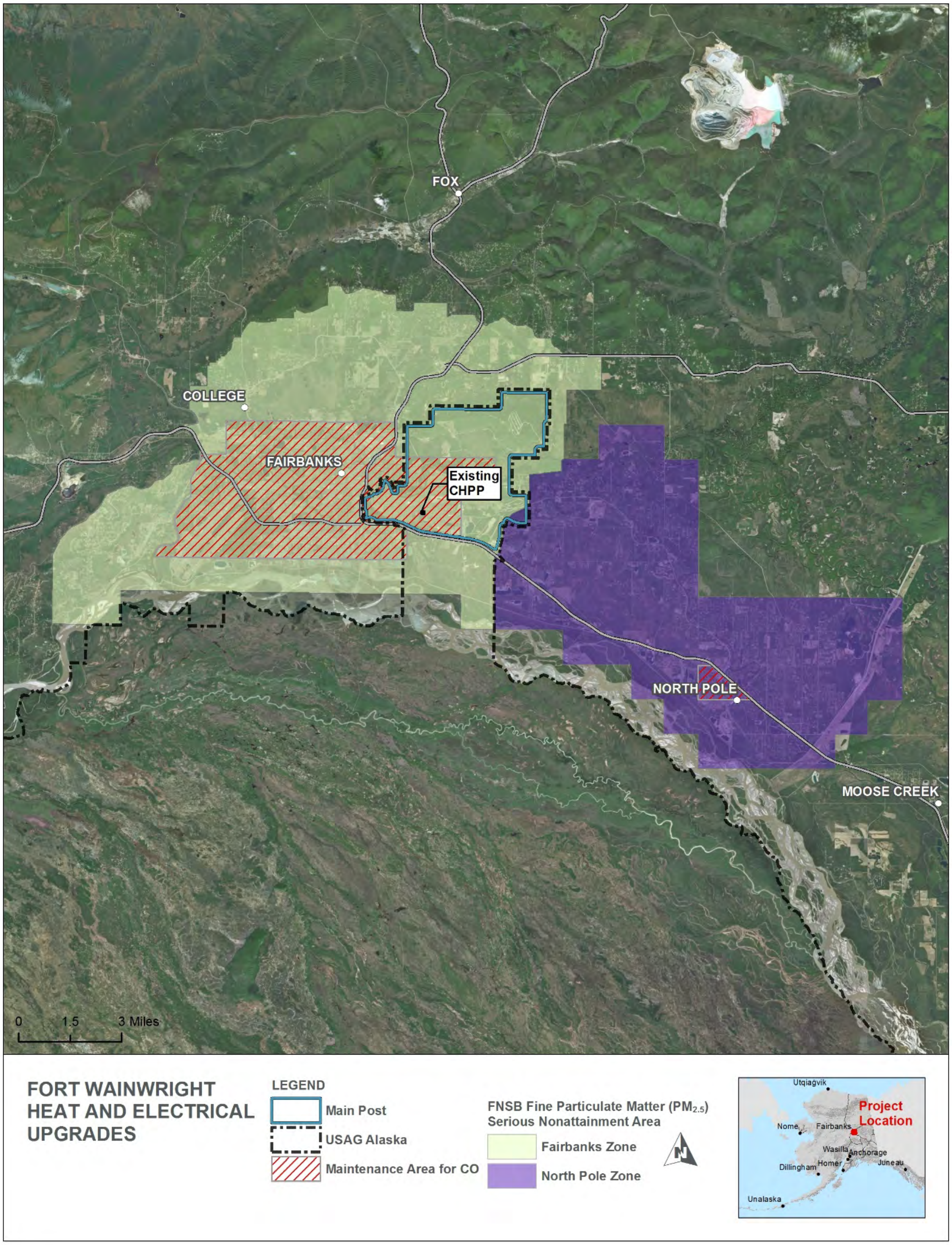


Figure 3.2-1. FNSB CO Maintenance and $PM_{2.5}$ Serious Nonattainment Areas

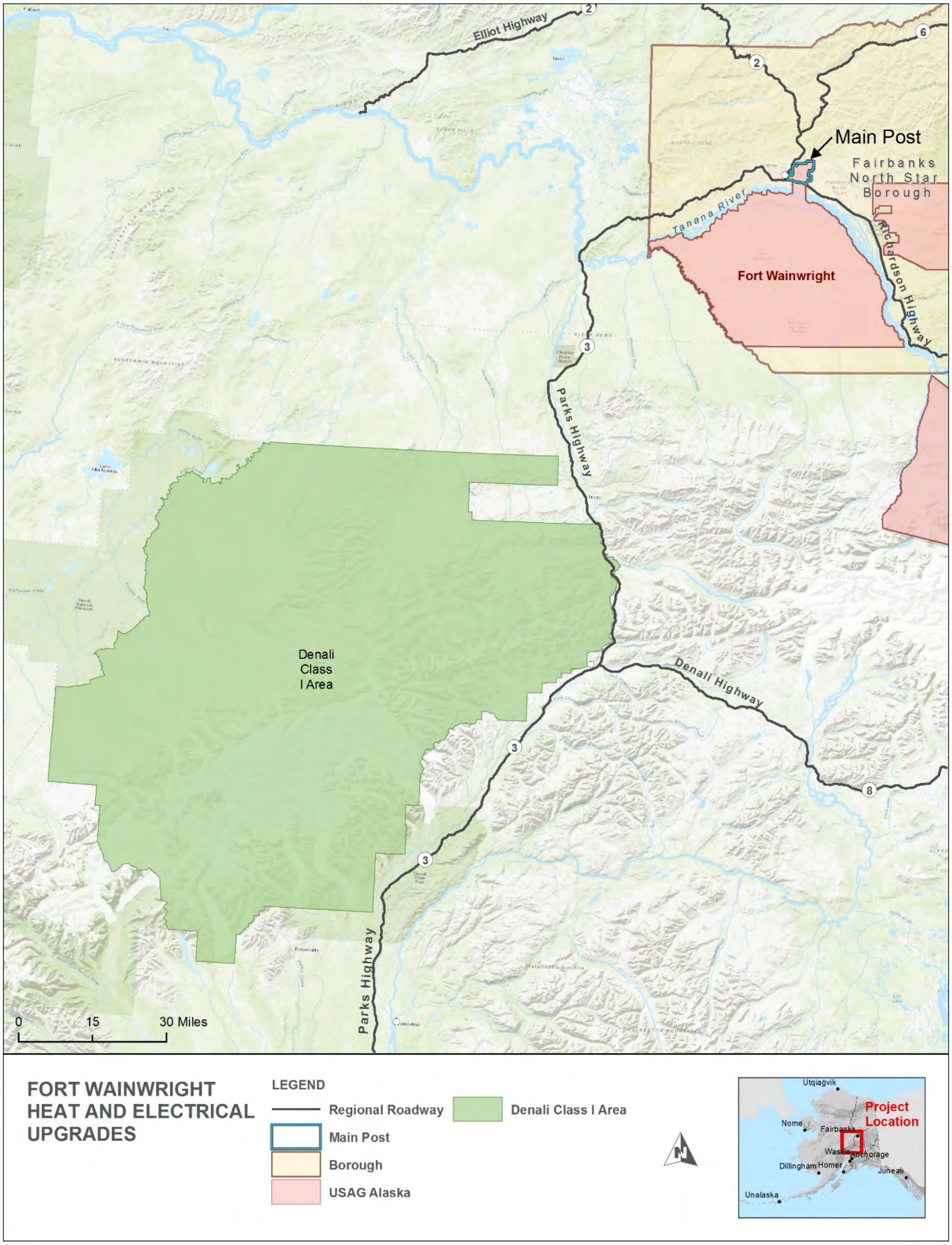


Figure 3.2-2. Class I Area near Fort Wainwright

Conformity

The 1990 amendments to the CAA require federal agencies to ensure that their actions conform to the SIP in a nonattainment area. The EPA has developed two distinctive sets of conformity regulations: one for transportation projects and one for non-transportation projects.

Transportation Conformity. Transportation conformity is required to ensure that federal funding and approval given to highway and transit projects are consistent with the attainment of air quality standards. The Proposed Action is not a highway or transit project and, therefore, is not subject to transportation conformity requirements.

General Conformity. Non-transportation projects are governed by general conformity regulations (40 CFR Parts 51 and 93), which are described in the final rule Determining Conformity of General Federal Actions to State or Federal Implementation Plans (published in the *Federal Register* on November 30, 1993). The General Conformity Rule requirements became effective January 31, 1994 and were updated effective March 24, 2010. Under Section 176(c) of the CAA, the General Conformity Rule became applicable 1 year after the $PM_{2.5}$ nonattainment designation became effective. Alaska has adopted the federal conformity regulations by reference (18 Alaska Administrative Code [AAC] 50.700–50.735).

The Proposed Action is governed by General Conformity rules because of its location within a $PM_{2.5}$ nonattainment area and a CO maintenance area. Therefore, a general conformity applicability assessment is required with respect to the $PM_{2.5}$ and CO NAAQS.

The General Conformity Rule specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project. As stated in 40 CFR § 93.153(b), "… a conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a federal action would equal or exceed any of the …" listed rates. For an area in serious nonattainment for the $PM_{2.5}$ NAAQS, the applicability criterion is 70 tpy for $PM_{2.5}$ (as well as individually for nitrous oxide [NO_x], SO_2, VOCs, and ammonia as precursors). For an action in a maintenance area, the applicability criteria is 100 tpy for the applicable pollutant. As such, the $PM_{2.5}$ emissions (and each of the precursor pollutant emissions) are individually compared to the 70-tpy threshold and CO emissions are compared to the 100-tpy threshold. This evaluation will be performed for both the direct and indirect emissions occurring during the construction phase and the direct and indirect emissions occurring during the operational phase.

None of the direct emissions associated with the No Action Alternative or any of the action alternatives are subject to General Conformity. Emissions generated by the on-site energy production equipment (i.e., the CHPP or the distributed natural gas boilers) would be subject to ADEC's Prevention of Significant Deterioration (PSD)/New Source Review (NSR) permitting and, therefore, are exempt from General Conformity, in accordance with 40 CFR § 93.153(d)(5).

Indirect emissions associated with the No Action Alternative and each Proposed Action would occur from mobile sources associated with each alternative. Emissions from additional electricity (beyond that currently supplied by local utilities) used but not produced at Fort Wainwright are not considered indirect emissions because Fort Wainwright cannot practically control those emissions and does not have continuing program responsibility for any actions taken by those utilities.

Indirect emissions for mobile sources under proposed Alternative 1 are expected to be the same as for the No Action Alternative. Alternatives 2 and 3 would result in a reduction in emissions because of the elimination of trains delivering coal and an increase in emissions from trucks delivering fuel oil (used only for backup purposes in each alternative) and liquefied natural gas (LNG) to the storage tank located in Fairbanks. The reduction in emissions resulting from the elimination of trains delivering coal is anticipated to be greater than the increase resulting from the infrequent delivery of the fuel oil and the routing delivery of LNG to Fairbanks. Therefore, indirect emissions from mobile source operations would be equal to or less than the No Action Alternative and will not be quantified or further discussed.

Air Quality Construction Permitting

ADEC implements programs for permitting the construction and operation of new or modified stationary sources of air emissions in Alaska that emit regulated pollutants. Depending on the type and size of the emissions units and levels of regulated pollutants emitted, ADEC determines the applicable emission standards and associated requirements for inclusion in the issued construction permit.

The air quality permitting process begins with the application for a construction permit. Each proposed alternative would require a permit to construct in one form or another. ADEC can issue four types of air quality construction permits for the construction and temporary operation of new emissions sources that are potentially applicable to each proposed alternative:

- Major New or Modified Source Construction Permit in Nonattainment Area (Nonattainment New Source Review [NNSR])
- PSD permit in Attainment (and maintenance) Area
- Minor source permit
- Owner Requested Limit (ORL) Permit

Major New Source Review

NNSR and PSD permits are both part of ADEC’s major NSR program. Thresholds that determine the type of construction permit that might be required depend on both the quantity and type of emissions. PSD review and permitting is required for sources emitting 100 tpy of any regulated pollutant for any of 28 named PSD source categories. One named source category is fossil fuel boilers that singly or in combination have a total heat input of more than 250 million British thermal units per hour (MMBtu/hr). For all other sources not in the 28 named source categories, PSD review is required if the source emits 250 tpy or more of any regulated pollutant. On the basis of its current equipment type (fossil fuel boilers that in combination total more than 250 MMBtu/hr of heat input) and potential to emit (PTE), Fort Wainwright is an existing major source for major NSR (both PSD and NNSR) permitting purposes (ADEC 2015a). Thresholds requiring either an NNSR or a PSD permit for a modification to an existing major source in the Fairbanks area are outlined in Table 3.2-1.

Table 3.2-1. Major Modification Thresholds of Criteria Pollutants in Fairbanks

Pollutant	Major Modification at an Existing NSR Major Source (tpy)	
	PSD	**NNSR**
NO_x	40	40 ($PM_{2.5}$ precursor)
CO	100	NA
SO_2	40	40 ($PM_{2.5}$ precursor)
PM	25	NA
PM_{10}	15	NA
$PM_{2.5}$	NA	10
VOC	40	NA

NA – not applicable

Major New or Modified Source Construction Permits in Nonattainment Areas (NNSR permits) are required for any major new sources or major modifications to existing sources intended to be constructed in an area designated as nonattainment. The PSD program protects the air quality in attainment areas (including areas designated as maintenance). PSD regulations impose limits on the amount of pollutants that major sources may emit. The PSD permitting process would apply to all pollutants for which the area is in attainment (with the exception of $PM_{2.5}$).

Currently, when undergoing a physical or operational change, a source determines major NSR applicability through a two-step analysis, performed separately for each NSR pollutant. First, an applicant determines whether the increased emissions from a particular proposed project alone are above the applicable NNSR and/or PSD thresholds. If the emissions increase is below the threshold, an NSR permit would not be required for that pollutant. If the emissions increase is above the threshold, the applicant then determines through a procedure called "netting" whether the net emissions of the project plus all contemporaneous increases and decreases in the previous 5 years at the source are above the thresholds. If this determination results in an increase that is lower than the threshold, an NSR permit for that pollutant would not be required.

NSR permits are legal documents that specify what construction is allowed; emissions limits that must not be exceeded; reporting, recordkeeping, and monitoring requirements;

and often how the source can be operated. The NSR permitting process typically takes 12 to 18 months. Specifically, typical requirements for an NSR permit can include the following:

- PSD
  - BACT review for criteria pollutants
  - Predictive dispersion modeling of emissions from proposed and existing sources, to estimate ambient concentration impacts
  - Additional impacts analysis
  - Impacts on nearby Class I areas
- NNSR
  - Lowest Achievable Emission Rate review for qualifying nonattainment pollutants (i.e., NOx, SO_2, and potentially VOC [as $PM_{2.5}$ precursors] and direct $PM_{2.5}$)
  - Acquiring emissions offsets at a one to three or greater ratio for all contemporaneous emission increases that have occurred or are expected to occur
- PSD and NNSR
  - A public involvement process
  - EPA review of the draft permit

Minor Source Preconstruction Permitting

Minor source and ORL permits are part of ADEC's minor source permitting program. Minor source permitting applies to facilities that do not have potential emissions that are above major source thresholds, but that trigger the requirement to have a minor source permit. ORL permits are typically used to limit otherwise major potential emissions to levels below major source permitting thresholds to minimize the permitting and compliance burden for facilities or projects that have actual emissions that would be below the major source thresholds.

Air Quality Operation Permit

Title V of the CAA requires states to establish an air operating permit program. The requirements of Title V are outlined in the federal regulations in 40 CFR Part 70 and in the ADEC regulations at 18 AAC 50.326. The permits required by these regulations are often referred to as Title V or Part 70 permits. Based on its PTE, Fort Wainwright is subject to the Title V permitting requirements.

Two Title V permits have been issued to stationary sources of emissions at Fort Wainwright. Permit No. AQ0236TVP03 (ADEC 2014), issued September 4, 2014, covers the emission units and activities that are not part of the CHPP operated by the System Owner. This permit includes small diesel boilers, generators, fire pumps, a landfill, restoration activities, and aerospace activities. These emission units are not anticipated to be affected by the proposed project.

The second Title V permit, Permit No. AQ1121TVP02 (ADEC 2015b), issued to the System Owner on January 30, 2015, covers the emission units and activities referred to as the Privatized Emission Units. This permit includes the CHPP coal-fired boilers and associated coal handling and storage, generators, and fire pumps. The CHPP boilers and associated coal handling and storage are subjects of this EIS and the generators and fire pumps covered by the permit are not anticipated to be affected by the Proposed Action. Table 3.2-2 summarizes the 2017 emissions from permitted sources at the Fort Wainwright stationary source. The CHPP boilers are currently operating at 20 percent reduced capacity to meet air quality standards, as discussed in Section 1.1.2.

Table 3.2-2. 2017 Emissions from Permitted Sources at the Fort Wainwright Stationary Source

Permit	Permitted Source (tpy)							
	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	Lead	GHG
UPC Permit								
CHPP	601	591	460	86.6	80.8	5.91	0.05	347,633
Non-CHPP	0.24	0.07	--	0.01	0.01	0.02	--	--
Non-UPC Permit	0.03	0.01	0.02	0.001	0.0002	0.0002	--	--
Total	601	591	460	87	81	6	0.05	347,633

Notes:

Sources: ADEC 2017a, ADEC 2017b, and EPA 2017.

GHG – greenhouse gas

3.2.1.3 Regional Climate

FNSB is located in Interior Alaska and is far removed from the moderating influence of Alaskan coastal waters. As a result, the area has a continental climate that is characterized by large daily and annual temperature ranges, low humidity, and relatively light and irregular precipitation compared to the climate of coastal southern Alaskan communities. Because of its low elevation, the Fairbanks area experiences extreme cold in the winter and relatively high (for Alaska) summertime temperatures.

The average annual water equivalent precipitation reported at Fairbanks International Airport (FAI) during the period between December 1, 1929, and June 9, 2016, was 10.53 inches. Average annual snowfall during the period was 65.2 inches. The average annual minimum temperature is 16.9 degrees Fahrenheit (°F) and the average annual maximum temperature is 36.9°F. The coldest month is January, with an average minimum temperature of -19.0°F during the period, while July is the warmest month, with an average maximum temperature of 72.3°F (Western Regional Climate Center [WRCC], 2019a). Extremes in temperature are documented to range from the low of -56°F during the winter months and as high as 94°F in the summer months during the period (WRCC, 2019b).

Temperature inversions are frequent in the winter. These inversions typically occur under clear skies, light winds, and extremely low surface temperatures. Wintertime inversions over Fairbanks, in combination with the region's low-lying terrain, result in periods of stagnant air during which air pollutants, especially from low level sources such as vehicles and woodstoves, are trapped within the inversion, limiting their vertical dispersion. In addition, light winds during inversions tends to limit horizontal transport and dispersion. Consequently, Fairbanks experiences periods of diminished air quality during the winter. The conditions that occur during these inversion incidents also contribute to the formation of ice fog in the Fairbanks area.

In addition to trapping pollutants emitted from low level sources, the inversions also limit the vertical dispersion of pollutants emitted from stacks such as those associated with the CHPP. The amount of rise of the exhaust prior to leveling out because of the inversion depends on the height of the release, as well as the exhaust exit velocity and temperature. In general, colder, slower exhaust streams released at lower heights will level off at a lower altitude than hotter, faster exhaust streams released at higher heights. Also, exhaust plumes released from stacks near each other tend to merge quicker than those released from distance separated stacks.

Prevailing airflow is from the north, and this is accentuated during the colder months. Annual average wind speed is very light, at less than 5 miles per hour (mph). Cold air drainage flows (i.e., terrain following) are common during the winter months. Surface winds change to a predominantly southwesterly flow during summer months.

During summer, Fairbanks occasionally experiences smoky periods caused by wildfires in the surrounding region. The smoky periods range from less than a day to several weeks, with the period duration and severity depending on the characteristics and locations of the wildfires, as well as on prevailing winds and precipitation. Smoke increases levels of particulate matter, CO, and O_3 precursors such as NO_x and VOC that can severely affect air quality.

3.2.1.4 Current Condition

Existing ambient air quality conditions near Fort Wainwright can be estimated from measurements conducted at air quality monitoring stations in and around the Fairbanks area. The most recent available data from EPA for monitoring stations nearest Fort Wainwright are summarized in Table 3.2-3.

Table 3.2-3. AAQS Local Ambient Air Quality Monitoring Values[a]

Pollutant, (Monitor Location) Averaging Period (Unit)	Primary NAAQS[b]	Secondary NAAQS[b]	Design Concentration[c]
CO (Site ID 020900034, 809 Pioneer Road, Fairbanks, AK)			
1-Hour (ppm)	35[c]	None	3.4
8-Hour (ppm)	9[c]	None	2
Lead (No lead monitor is sited in Alaska)			
3-Month Rolling Average (µg/m^3)[d]	0.15	0.15	-- [e]
NO_2 (Site ID 020900034, 809 Pioneer Road, Fairbanks, AK)			
1-Hour (ppb) [f]	100	100	55
Annual Arithmetic Mean (ppb)[d]	53	53	12.54
O_3 (Site ID 020900034, 809 Pioneer Road, Fairbanks, AK)			
8-Hour (ppm)[g]	0.070	0.070	0.042
$PM_{2.5}$ (Site ID 020900010, 675 7th Avenue, Fairbanks, AK, Monitor 1)			
24-Hour (µg/m^3)[h, i]	35	35	35
Annual Mean (µg/m^3)[j]	12.0	15.0	9.7
PM_{10} (Site ID 020900034, 809 Pioneer Road, Fairbanks, AK, Monitor 3)			
24-Hour (µg/m^3)[k]	150	150	69
SO_2 (Site ID 020900034, 809 Pioneer Road, Fairbanks, AK)			
1-Hour (ppb)[l]	75	None	36
3-Hour (ppm)[c]	None	0.5	0.037

Notes:

ppb – parts per billion

a. The design values represent the most recent 3 years (2016-2018) of monitoring values available as of March 2020 (EPA 2020a).

b. Source: 40 CFR §§ 50.1–50.19 (as summarized by EPA at https://www.epa.gov/criteria-air-pollutants/naaqs-table, accessed June 2019) and 18 AAC 50.010.

c. Not to be exceeded more than once per year.

d. Not to be exceeded.

e. According to ADEC *2018 Annual Air Quality Monitoring Network Plan* (ADEC 2018a), “No monitoring is required for lead anywhere in the Alaskan [Core Based Statistical Areas] CBSAs.”

f. The 3-year average of the 98th percentile of 1-hour daily maximum concentrations over each year must not exceed the standard.

g. The 3-year average of the fourth highest daily maximum 8-hour average concentration over each year must not exceed the standard.

h. Source: ADEC 2020.

i. The 3-year average of the 98th percentile of 24-hour concentrations must not exceed the standard.

j. The 3-year average of the annual mean concentration must not exceed the standard.

k. Not to be exceeded more than once per year on average over 3 years.

l. The 3-year average of the 99th percentile of 1-hour daily maximum concentrations must not exceed the standard.

The CAA, as amended in 1990, mandates that state agencies adopt SIPs that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS. The portion of the Fairbanks area in which Fort Wainwright is located was designated as a $PM_{2.5}$ moderate nonattainment area in December 2009. Because the Fairbanks area was a moderate nonattainment area for the $PM_{2.5}$ NAAQS, the State of Alaska was required to develop a SIP that outlines the actions to be taken to achieve the $PM_{2.5}$ NAAQS. This plan was submitted to EPA in December 2014 with an attainment date, set by the requirements of the CAA, of December 31, 2015. This attainment date was not obtainable or practical for the levels of $PM_{2.5}$ recorded for the locations. On April 28, 2017, EPA reclassified the area from moderate to serious for the 2006 24-hour $PM_{2.5}$ NAAQS because the standard had not been attained by the December 31, 2015, deadline. This reclassification triggered the requirement to develop, submit, obtain EPA approval for, and implement a SIP to ensure attainment of the standard by December 31, 2019. ADEC adopted the SIP on November 19, 2019, which became effective January 8, 2020. As of March 2020, the plan has been sent to EPA for review and approval, but EPA has not taken action on the plan.

The current EPA-approved regional air quality plan is the “Fairbanks North Star Borough (FNSB) Fine Particulate Matter (PM2.5) Moderate Area Attainment Plan,” in Volume II, Section III.D.5, of the *Alaska Air Quality Control Plan* (ADEC 2017c). ADEC compiled a regional emissions inventory and set regional emissions budgets within this plan.

3.2.2 Environmental Consequences

3.2.2.1 Significance Criteria

An impact on air quality would be considered significant if the Army action were to result in any of the following:

- An increase in emissions relative to the regulatory de minimis thresholds for the pollutants identified in Table 3.2-1
- Interference with achieving NAAQS, as outlined in Table 3.2-3

3.2.2.2 No Action Alternative

Under the No Action Alternative, operation of the existing CHPP would continue. Based on ADEC documentation, the CHPP’s coal-fired boilers will be required to install and operate dry sorbent injection and control SO_2 emissions to 0.12 pound per million British thermal units (lb/MMBtu) or less by October 1, 2023. This emission reduction would be achieved by installation of BACT measures.

The actual SO_2 emissions listed in Table 3.2-2 for the CHPP are based on a coal sulfur content of 0.11 percent, which corresponds to 0.26 lb/MMBtu. Based on this information, BACT limitations would result in future anticipated CHPP emissions that are 54 percent lower than current emissions level, and all other pollutant emissions would be unchanged from current levels.

On the basis of the CHPP's emissions during the baseline year of 2014, the regional haze implementation Q/d value would be approximately 15, which is above the preliminary ADEC trigger threshold of 10. Comparison of the 2014 and 2017 emission inventories, however, reveals that the 2014 values may be conservatively high. Although the 2014 inventory indicated that the emission factor used was from stack testing, it does not appear that is the case. The same emission factor was used for each boiler and corresponds to an EPA default emission factor. In contrast, the 2017 emission inventory used a different emission factor for each boiler (also indicated as being from stack testing). EPA's regional haze implementation memorandum (EPA 2019a) contains procedures for adjusting baseline year emissions in this type of circumstance. If the CHPP emissions are adjusted to reflect the 2017 NO_x emissions and the 54 percent reduction in SO_2 emissions that would be required by the $PM_{2.5}$ SIP, the corresponding Q/d value is approximately 7, which is below ADEC's preliminary trigger threshold.

Because no increase in emissions would result under the No Action Alternative, the impact on air quality would not be significant. The CHPP would continue to operate at reduced capacity to comply with CO emission standards.

3.2.2.3 Alternative 1 (Build a New Coal CHPP)

Under Alternative 1, short-term, minor adverse and long-term, minor, beneficial impacts would occur as a result of the demolition of the existing CHPP and construction of a new coal-fired CHPP. Criteria pollutants and greenhouse gas (GHG) would be released from vehicles and equipment during the construction activities associated with Alternative 1. Because these would be short term and localized in nature and impact, they are not anticipated to significantly affect the air quality in the Fairbanks area. Further, most construction emissions would occur during the warmer seasons, whereas the $PM_{2.5}$ nonattainment problem in Fairbanks is primarily a wintertime issue.

USAG Alaska does not currently have sufficient design or construction sequencing detail for use in calculating the construction emissions anticipated for Alternative 1. Therefore, construction-related emissions were estimated based on the *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (USARAK 2009). This information was deemed appropriate for use as explained below.

The footprint of Fort Wainwright's existing CHPP is approximately 7 acres and the footprint of the Alternative 1 facility is expected to be similar in size or smaller. The analysis presented in USARAK 2009 was based on 22 acres of land being worked each year of construction and associated material delivery and removal from the facility. Although the projects are dissimilar in detail, the USARAK construction emissions is considered a conservatively high estimate of the emissions that would be generated during the construction of Alternative 1, which are summarized in Table 3.2-4.

Table 3.2-4. Anticipated Construction Emissions, Alternative 1

Anticipated Construction Emissions (tpy)				
CO	NO_x	SO_2	$PM_{2.5}$	VOC
20.3	17.6	0.32	5.4	2.1

Localized impacts from equipment emissions and fugitive dust generated by construction activities may occur, but dust abatement measures would be implemented as BMPs to minimize dust problems. The abatement measures include, but are not limited to the following:

- As available, use of newer model construction equipment to minimize engine emissions
- Water exposed disturbed areas and material storage piles as needed to minimize wind-generated dust
- Water and/or sweep facility roads as needed to remove material tracked onto roadways and minimize dust emissions from vehicle movement
- Cover trucks hauling wind-erodible materials

Short-term and long-term, minor, beneficial impacts could occur as a result of the replacement of the existing CHPP with a new coal-fired CHPP and purchases of additional electricity from a local utility provider.

The type of air quality construction permitting required for Alternative 1 depends on the quantity of emissions and timing of the shutdown of the existing CHPP. Operating emissions for the new CHPP of Alternative 1 were calculated based on anticipated fuel usage, together with emission factor information obtained from the recently permitted, new, coal-fired boiler installed and operating at the University of Alaska Fairbanks Campus; from 40 CFR Part 98, Subpart C, Tables C-1 and C-2; and from EPA's AP-42, Section 1.1 (EPA 1998a), and ADEC's SO_2 BACT determination for the existing CHPP. Methods and assumptions used to estimate emissions are described in Appendix C. The detailed emission calculations for the new CHPP of Alternative 1 are presented in Table 3.2-5.

As part of Alternative 1, the existing CHPP would be removed from service and no longer emit air pollutants to the atmosphere. With the exception of SO_2, the amount of these anticipated decreases would be based on their actual emissions, as summarized in Table 3.2-2. The amount of SO_2 decrease associated with removal of the existing CHPP was estimated using the future BACT required reduction for the existing CHPP of 54 percent and the historic emissions of 460 tpy value in Table 3.2-2. An anticipated SO_2 emissions decrease of 212 tpy of SO_2 is associated with removal of the existing CHPP.

Table 3.2-5. New Coal CHPP Emissions Estimate

Pollutant	Emission Factor			Emissions (tpy)
	Number	Units	Note	
PM	0.030	lb/MMBtu	a	36.5
PM_{10}	0.012	lb/MMBtu	a	14.6
$PM_{2.5}$	0.012	lb/MMBtu	a	14.6
NO_x	0.20	lb/MMBtu	a	243
SO_2	0.120	lb/MMBtu	a	146
CO	0.180	lb/MMBtu	a	219
VOC	0.050	lb/ton	a	4.03
CO_2e	--	--	b	262,341
CO_2	97.17	kg/MMBtu	c	260,327
CH_4	0.011	kg/MMBtu	c	29.47
N_2O	0.0016	kg/MMBtu	c	4.29
Lead	4.2E-04	lb/ton	d	0.034

The annual operations emissions associated with Alternative 1 are summarized in Table 3.2-6. Table 3.2-6 also identifies the change in emissions (net effect) anticipated as a result of operating the new CHPP and decommissioning the existing CHPP, as proposed under Alternative 1.

Table 3.2-6. Operational Emissions Comparison, Alternative 1

	Emissions (tpy)							
	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	VOC	Lead	GHG
Alternative 1	219	243	146	14.6	14.6	4.03	0.034	262,341
Existing CHPP Decommissioned	-591	-601	-212	-86.6	-80.8	-5.91	-0.05	-347,633
Net Effect	-372	-358	-217	-66	-66.2	-1.88	-0.016	-85,292

Because the net emissions from Alternative 1 would be less than the threshold values listed in Table 3.2-1 and result in a reduction in pollutant emissions, Alternative 1 would have no adverse effects on air quality. Alternative 1 would reduce emission levels for all eight criteria pollutants, resulting in a long-term, beneficial impact from operation of the new CHPP. Alternative 1 would reduce CO emissions by more than 60 percent and greenhouse gas emissions by about 24 percent, compared to the No Action Alternative.

Operational emissions would be minimized by implementing the following BMPs:

- Maintaining compliance with all requirements of the ADEC-issued air permit
- Routine maintenance and tuning of combustion equipment
- Routine training of equipment operators and maintenance personnel
- Following equipment manufacturer recommended procedures for minimizing emissions

Operation of the existing CHPP and the Alternative 1 new CHPP would overlap for a short time during equipment startup, shakedown, and performance verification. This overlap is expected to be of short duration and the new equipment would typically be operated at less than maximum capacity during this period.

As discussed previously, the only emissions potentially subject to General Conformity are those associated with the construction of Alternative 1 presented in Table 3.2-4. Because emissions of $PM_{2.5}$ and all precursors are less than the General Conformity threshold, the requirements of General Conformity would not apply to Action Alternative 1.

The existing CHPP's contribution to current adverse conditions has already been determined and addressed in ADEC's SIP for the serious $PM_{2.5}$ nonattainment area. Further, ADEC's air quality construction permitting requirements require that any action alternative demonstrate modeled compliance with all NAAQS and does not contribute significantly (as defined by ADEC air quality rules) to the current adverse conditions. Therefore, de minimis threshold and NAAQS would be met through ADEC permitting rules.

For Alternative 1, the regional haze implementation Q/d value would be approximately 3, which is below ADEC's preliminary trigger threshold.

Alternative 1 would emit approximately 30 percent less water than the No Action Alternative (on an annual basis), and would be expected to have a similar stack exhaust height. Therefore, Alternative 1 would not be expected to adversely affect ice fog formation characteristics.

3.2.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

The same approach used for estimating construction emissions for Alternative 1 was used to estimate construction emissions for Alternative 2. Therefore, similar short-term, adverse impact could occur as a result of the demolition of the existing CHPP and construction of a new natural gas-fired CHPP.

Long-term, minor, beneficial impacts could occur as a result of the replacement of the existing CHPP with a new dual-fuel combustion turbine generator CHPP and the purchase of additional electricity from a local utility provider.

The type of air quality construction permitting that would be required for Alternative 2 depends on the quantity of emissions and timing of the shutdown of the existing CHPP. Operating emissions for the new natural gas-fired (with fuel oil backup) CHPP of Alternative 2 were calculated based on anticipated fuel usage and emission factor information obtained from numerous recent similar projects. The detailed emission calculations for the new CHPP of Alternative 2 are presented in Table 3.2-7.

As part of Alternative 2, the existing CHPP would be removed from service and no longer emit air pollutants to the atmosphere. The amount of these anticipated decreases would be based on their actual emissions, as summarized in Table 3.2-2.

The annual operations emissions associated with Alternative 2 are summarized in Table 3.2-8. Table 3.2-8 also identifies the change in emissions (net effect) anticipated as a result of operating the new, dual-fuel combustion CHPP and decommissioning the existing CHPP, as proposed under Alternative 2.

Table 3.2-7. New Natural Gas CHPP Emissions Estimate

Pollutant	Natural Gas			Fuel Oil			Total Emissions (tpy)
	Emission Factor		Emissions (tpy)	Emission Factor		Emissions (tpy)	
	Number	Units		Number	Units		
PM	0.010	lb/MMBtu	12.4	0.039	lb/MMBtu	2.56	15.0
PM_{10}	0.010	lb/MMBtu	12.4	0.039	lb/MMBtu	2.56	15.0
$PM_{2.5}$	0.010	lb/MMBtu	12.4	0.039	lb/MMBtu	2.56	15.0
NO_x							
Warm Weather	0.0921	lb/MMBtu	87.1	0.2726	lb/MMBtu	13.6	212
Cold Weather	0.3537	lb/MMBtu	105.9	0.3537	lb/MMBtu	5.58	
SO_2	0.0034	lb/MMBtu	4.23	0.0015	lb/MMBtu	0.10	4.33
CO							
Warm Weather	0.056	lb/MMBtu	53.0	0.056	lb/MMBtu	2.79	162
Cold Weather	0.336	lb/MMBtu	100.7	0.336	lb/MMBtu	5.30	
VOC							
Warm Weather	0.018	lb/MMBtu	17.4	0.018	lb/MMBtu	0.92	29.9
Cold Weather	0.037	lb/MMBtu	11.03	0.037	lb/MMBtu	0.58	
CO_2e	--	--	--	--	--	10,720	156,487
CO_2	53.06	kg/MMBtu	145,617	73.96	kg/MMBtu	10,683	156,300
CH_4	0.001	kg/MMBtu	2.74	0.003	kg/MMBtu	0.43	3.18
N_2O	0.0001	kg/MMBtu	0.27	0.0006	kg/MMBtu	0.09	0.36
Lead	--	--	--	1.4E-05	lb/MMBtu	0.0009	0.0009

Note: Although fuel oil is the backup energy source, fuel oil has a shelf life and refreshing stored oil once per year is required for testing and maintenance purposes.

Table 3.2-8. Operational Emissions Comparison, Alternative 2

	Emissions (tpy)							
	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	VOC	Lead	GHG
Alternative 2	162	212	4.33	15.0	15.0	29.9	0.0009	156,487
Existing CHPP Decommissioned	-591	-601	-212	-86.6	-80.8	-5.91	-0.05	-347,633
Net Effect	-429	-389	-208	-71.6	-65.8	24.0	-0.049	-191,146

Operational emissions would be minimized by implementing the following BMPs:

- Maintaining compliance with all requirements of the ADEC-issued air permit
- Routine maintenance and tuning of combustion equipment
- Routine training of equipment operators and maintenance personnel
- Following equipment manufacturer recommended procedures for minimizing emissions

Alternative 2 would reduce emission levels for all but one criterion pollutant. Although emissions levels would increase for VOCs under Alternative 2, levels would remain below the threshold values listed in Table 3.2-1. Alternative 2 would result in long-term, minor, beneficial impacts on air quality, with the exception of increased emission levels associated with VOCs. Impacts on air quality resulting from an increase in VOC emissions would not be significant. Alternative 2 would have greater reductions to most criteria pollutants than Alternative 1 and would reduce CO and greenhouse gas emissions by more than 70 percent and 50 percent, respectively, compared to the No Action Alternative.

Operation of the existing CHPP and the Alternative 2 new natural gas–fired CHPP would overlap for a short period of time during equipment startup, shakedown, and performance verification. This overlap is expected to be of short duration, and the new equipment would typically be operated at less than maximum capacity during this period.

As discussed previously, the only emissions potentially subject to General Conformity are those associated with the construction of Alternative 2 presented in Table 3.2-4. Because emissions of $PM_{2.5}$ and all precursors are less than the General Conformity threshold, the requirements of General Conformity would not apply to Alternative 2.

For Alternative 2, the regional haze implementation Q/d value would be approximately 2, which is below ADEC's preliminary trigger threshold.

Alternative 2 would emit approximately 32 percent less water than the No Action Alternative (on an annual basis), and would be expected to have a similar stack exhaust height. Therefore, Alternative 2 would not be expected to adversely affect ice fog formation characteristics.

3.2.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

The same approach for estimating construction emissions for Alternative 1 was used to estimate construction emissions for Alternative 3. Therefore, similar short-term, minor adverse impacts could occur as a result of the demolition of the existing CHPP and construction of the distributed natural gas boilers.

Long-term, moderate, beneficial impacts could occur as a result of the replacement of the existing CHPP with distributed natural gas boilers and the purchase of additional electricity from a local utility provider.

The type of air quality construction permitting that would be required for Alternative 3 depends on the quantity of emissions and timing of the shutdown of the existing CHPP. Operating emissions for the distributed natural gas boilers of Alternative 3 were calculated based on anticipated fuel usage and emission factor information obtained from EPA emission factors documentation. The detailed emission calculations for the new distributed boilers of Alternative 3 are presented in Table 3.2-9. Alternative 3 would include the intermittent use of No. 2 fuel oil at select critical locations for use in the event of an interruption in natural gas supply. The occurrence of these events is unknown and unpredictable, and emissions would be similar to those associated with normal operation of the boilers on natural gas. Because the amount of this infrequent use of No. 2 fuel oil cannot be predicted and the associated emissions would not change the conclusions of this analysis, they are not quantified or discussed further.

As part of Alternative 3, the existing CHPP would be removed from service and no longer emit air pollutants to the atmosphere. The amount of these anticipated decreases would be based on their actual emissions, as summarized in Table 3.2-2.

The annual operations emissions associated with Alternative 3 are summarized in Table 3.2-10. Table 3.2-10 also identifies the change in emissions (net effect) anticipated as a result of operating the new, distributed gas boilers and decommissioning the existing CHPP, as proposed under Alternative 3.

Table 3.2-9. New Distributed Natural Gas Boilers Emissions Estimate

Pollutant	Emission Factor		Emissions (tpy)
	Number	Units	
PM	0.0093	lb/MMBtu	7.24
PM_{10}	0.0093	lb/MMBtu	7.24
$PM_{2.5}$	0.0093	lb/MMBtu	7.24
NO_x	0.0980	lb/MMBtu	76.2
SO_2	0.0006	lb/MMBtu	0.46
CO	0.082	lb/MMBtu	64.0
VOC	0.0054	lb/MMBtu	4.19
CO_2e	--	--	91,067
CO_2	53.06	kg/MMBtu	90,973
CH_4	0.001	kg/MMBtu	1.71
N_2O	0.0001	kg/MMBtu	0.17
Lead	4.90E-07	lb/MMBtu	0.0004

Table 3.2-10. Operation Emissions Comparison, Alternative 3

	Emissions (tpy)							
	CO	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**Lead**	**GHG**
Alternative 3	64.0	76.2	0.46	7.24	7.24	4.19	0.0004	91,067
Existing CHPP Decommissioned	-591	-601	-212	-86.6	-80.8	-5.91	-0.05	-347,633
Net Effect	-527	-525	-212	-79.4	-73.6	-1.72	-0.496	-256,566

Because the net emissions from Alternative 3 would reduce pollutant emissions and would be less than the threshold values listed in Table 3.2-1, Alternative 3 would have no adverse impacts on air quality. Alternative 3 would reduce emission levels for all eight criteria pollutants and, for some, the reductions would be substantial. Alternative 3 would reduce CO emissions by almost 90 percent and greenhouse gas emissions by more than 70 percent, compared to the No Action Alternative. Operation of the distributed gas boilers and decommissioning the existing CHPP, as proposed under Alternative 3, would result in long-term, moderate, beneficial impacts on air quality.

Operational emissions would be minimized by implementing the following BMPs:

- Maintaining compliance with all requirements of the ADEC-issued air permit
- Routine maintenance and tuning of combustion equipment
- Routine training of equipment operators and maintenance personnel
- Following equipment manufacturer recommended procedures for minimizing emissions

Operation of the existing CHPP and the distributed natural gas boilers would overlap for a short period of time during equipment startup, shakedown, and performance verification of each phase of the distributed boiler installation. This overlap is expected to be of short duration, and the new equipment would typically be operated at less than maximum capacity during this period. Transition from the CHPP to distributed boilers would also be longer than in Alternatives 1 and 2 while the separate boilers come online.

As discussed previously, the only emissions potentially subject to General Conformity are those associated with the construction of Alternative 3 presented in Table 3.2-4. Because emissions of $PM_{2.5}$ and all precursors are less than the General Conformity threshold, the requirements of General Conformity would not apply to Action Alternative 3.

For Alternative 3, the regional haze implementation Q/d value would be approximately 1, which is below ADEC's preliminary trigger threshold.

Alternative 3 would emit approximately 60 percent less water than the No Action Alternative (on an annual basis), but would be expected to have lower stack exhaust heights. A 2018 report (Weatherly et al. 2018) provided results of modeling ice fog formation for a number of possible alternatives, focusing mostly on the distributed natural gas boiler option of Alternative 3. The analysis concluded that the increase in ice fog density is approximately linear with the amount of vapor produced; however, the report was not able to quantify the anticipated impact on ice fog formation because of the change in water introduced to the atmosphere. Further, natural gas heating has been used in the Siku Basin Housing Area on the Fort Wainwright Main Post since 2008 with no observed issues related to ice fog formation.

3.3 Utilities

3.3.1 Affected Environment

The ROI for utilities is the Fort Wainwright Main Cantonment Area, which encompasses the area in which utilities may be affected. The locations of utilities are considered sensitive and are not disclosed in this EIS.

3.3.1.1 Definition of Resource

Utilities are a type of man-made infrastructure that enable communities to function by providing for basic needs such as energy, heat, clean drinking water, and liquid and solid waste disposal. The availability of utilities and their capacities to support growth are generally regarded as essential to the economic growth of an area. The utilities potentially affected by the Proposed Action and its alternatives are the CHPP, steam distribution system, and utilidors on Fort Wainwright; electricity, natural gas, liquid fuels, and water supply to Fort Wainwright and the Fairbanks region; and wastewater and solid waste management.

3.3.1.2 Environmental Laws, Regulations, and Executive Orders

There are no specific regulations for managing or evaluating impacts on utilities. Environmental laws applicable to utilities are already discussed in more applicable resource areas, such as Section 3.2.1.2 on Air Quality. Energy use and conservation are integral components of many utility services. CEQ NEPA regulations at Sections 1502.16(e) and (f) require that federal agencies consider energy and natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures in NEPA documents. Other regulations such as the Energy Independence and Security Act (42 U.S.C. § 17001 et seq.), Energy Policy Act (42 U.S.C. § 13201 et seq.), and EO 13834 require federal agencies to take actions to move the country toward energy independence and security by promoting energy efficiency, renewable energy sources, and energy performance standards. These regulations are considered and addressed where appropriate in the utilities analysis. Utility and infrastructure capacities are analyzed in this section. No applicable laws associated with utility distribution have been identified.

3.3.1.3 Current Condition

USAG Alaska has privatized many utility systems on Fort Wainwright, including the CHPP; the steam distribution system that encompasses the utilidors; and electric, water, and wastewater systems. Through a 50-year lease under a UPC, the System Owner is the operator of these utility systems on Fort Wainwright and is responsible for service expansions, repairs, and day-to-day management (USAG Fort Wainwright 2017a).

Heating Infrastructure

Fort Wainwright's CHPP generates all heat and the majority of the electricity needed for the installation. Operation of the CHPP began in 1955. The CHPP is one of the oldest operational coal-fired power plants in the United States. The plant uses six identical coal-fired Wickes stoker boilers that deliver 150,000 lb/hr of superheated steam with a capacity of 450 pounds per square inch gauge (psig). The CHPP has a design life of 40 years, consistent with Army policy guidance that states the maximum life cycle of a CHPP is typically 40 years (USACE 2012). Repairs have been performed on the boilers as needed; however, after more than 65 years of consistent operation, each boiler is nearing the end of its service life and requires substantial investment to sustain operation. The CHPP building is also in poor condition, with signs of structural issues and a sagging roof that indicates the need for a roof replacement, and requires substantial investment to maintain structural integrity (Black and Veatch 2018).

Subbituminous coal is combusted in the CHPP. The coal is obtained from a local coal mine in Healy, Alaska, and delivered by train to Fort Wainwright (Black and Veatch 2018). A 90-day supply of coal is typically kept on the installation (USACE 2007). Approximately 220,000 tons of coal is burned each year (USAG Fort Wainwright 2017a). The mine is projected to have sufficient reserves for sustained use of coal for a minimum of 50 years. Coal ash is a byproduct of the combustion process (see Solid Waste Management below). Steam generated from the CHPP is distributed in 24- and 16-inch mains that run to each building with heating systems on the installation at 80 psig and 325 °F. As the steam cools, it condenses into liquid water that is returned to the CHPP in condensation lines. Most of the steam distribution system was constructed in the early 1950s; many upgrades and additions have occurred over the years (Black and Veatch 2018).

Most steam and condensate mains are installed inside a concrete tunnel network, or utilidor, connecting the various buildings. Many distribution lines for other utilities, including potable and fire water distribution, wastewater collection (i.e., sewer), hot water supply and return, glycol supply and return, and low-voltage electrical and communication systems, are collocated within the utilidors. The utilidors range in size from 18 inches by 18 inches to 108 inches by 84 inches and are buried at varying depths. The utilidors require substantial maintenance and are subject to flooding because of the high water table on the installation. There are 28.6 linear miles of steam mains and 23.3 linear miles of condensate lines in utilidors. Although heat loss in the steam distribution system is substantial (25 percent of heat generated), the system does ensure that smaller water and sewer lines do not freeze (USACE 2018). An additional 5.9 linear miles of steam mains and 6.4 linear miles of condensate lines are direct buried without use of utilidors (Black and Veatch 2018).

The CHPP and its associated infrastructure are vital components of Fort Wainwright's ability to heat buildings, generate electricity, and function in a subarctic climate. A catastrophic service failure could jeopardize the ability to sustain the military mission on Fort Wainwright. Fort Wainwright has only four emergency backup boilers on the installation: three at Bassett Hospital and one at Building 5007. These backup boilers are liquid fueled. No other facilities have backup heating (ADEC 2014, ADEC 2015b).

Electricity

The majority of the electricity used on Fort Wainwright is generated by the CHPP. The CHPP can produce a maximum of 21 MW/hr of electricity when all four turbines are in operation, which meets the peak electrical demand of Fort Wainwright. The local electrical utility provider supplies a contingency service. Emergency electricity generators are installed in mission-critical facilities across the installation to sustain operations during outages of electricity sourced from both the CHPP and the local service provider. These generators have capacities ranging from 10 to 2,500 kilowatts (USAG Fort Wainwright 2017a, ADEC 2014, ADEC 2015b).

Fort Wainwright's electric distribution system consists of eight circuits that originate from a 12.47-kilovolt switchgear within the CHPP. The switchgear also provides a 12.47-kilovolt interconnection to the local electricity provider supply lines. Electricity is distributed to buildings on Fort Wainwright through 81.5 linear miles of overhead primary and secondary distribution lines and 4.8 linear miles of underground distribution circuits. In addition, approximately 920 pole-type transformers and 115 pad-mount transformers are located throughout the installation (USAG Fort Wainwright 2017a).

Natural Gas

Natural gas used in the Fairbanks region is produced and liquefied at facilities in Cook Inlet and transported by truck to the gas provider for storage. The gas is then regasified and distributed through natural gas mains to customers. The local gas provider completed construction of a new 5.25-million-gallon LNG storage tank in Fairbanks and is performing other system upgrades so that new customers can soon be serviced with natural gas (Ellis 2019). Natural gas is currently only used in the Siku Basin Housing Area on the Fort Wainwright Main Post.

Liquid Fuels

The installation does not rely on liquid fuels (e.g., heating oil, diesel, ULSD) for everyday building heating and electric generation purposes; however, bulk deliveries of liquid fuels are made to Fort Wainwright for use in automobile and aircraft fueling, emergency electricity generators, emergency fire pump engines, and four emergency backup boilers (ADEC 2014, ADEC 2015b). Approximately two-thirds of Alaska's liquid fuels supply is sourced from five in-state refineries in Prudhoe Bay, Fairbanks, Nikiski, and Valdez. The balance is met through seasonal bulk imports from Washington, California, and international sources to Anchorage. Regionally, liquid fuels are delivered to Fairbanks by rail or truck for storage. Local suppliers truck the liquid fuels to Fort Wainwright through contracts managed by the Defense Logistics Agency (DLA). Alaska consumes approximately 33,400 barrels of liquid fuels per day on average (Black and Veatch 2018).

Water

Fort Wainwright obtains all potable and non-potable water from nine groundwater wells located on the installation. Two of these wells are the primary and two others are the secondary water supply wells for the water treatment plant. Three fire protection wells and two CHPP backup wells provide water during a fire emergency and backup supply for the CHPP. The installation does not currently have an interconnection to any local water service provider (USAG Fort Wainwright 2017a).

The two primary groundwater wells can produce up to 4.9 million gallons per day (mgd), which is substantially greater than the highest average daily potable water demand of 2.7 mgd. With all nine groundwater wells, the overall combined water supply is 9.3 mgd (USAG Fort Wainwright 2017a).

The installation's water treatment plant was originally constructed in 1953, and the treatment process has not changed appreciably. The plant includes treatment equipment, pumps, and a 1.3 million-gallon storage capacity. It is capable of treating 3.5 mgd (USAG Fort Wainwright 2017a). There are 36.7 miles of potable water distribution pipe on Fort Wainwright, of which 30.4 miles are within the utilidors and 6.3 miles are direct buried. The steam distribution system heats the utilidors to prevent freezing the utilidor-located water pipes. The direct buried water pipes are also at depths sufficient to prevent freezing (Doyon Utilities 2016).

Wastewater

Wastewater produced on Fort Wainwright is collected and transported through lift stations, force mains, and gravity piping off-post to a local utility provider for disposal. There are 29 lift stations and 24.2 miles of sanitary sewer lines on Fort Wainwright. Approximately 69 percent of these wastewater lines are within a utilidor and do not freeze because they are below ground and heat travels through the high water flow. The remainder of these lines are direct buried at a depth and diameter sufficient to prevent freezing. The installation produces 2.0 mgd of wastewater during the peak season. The design capacity of the installation's wastewater lines is between 2.0 and 2.5 mgd (USAG Fort Wainwright 2017a).

Solid Waste Management

Solid waste is any garbage, refuse, sludge, or other discarded materials resulting from industrial, commercial, institutional, and residential activity. Most activities performed on Fort Wainwright produce solid waste such as paper, cardboard, steel and aluminum cans, plastic and glass beverage bottles, plastics, packaging materials, scrap metal, textiles, pallets, batteries, tires, food, coal ash, and construction and demolition wastes. The installation is responsible to report all solid waste diversion and requires repurposing when applicable for reuse. Construction and demolition contractors are responsible for the disposal of all solid wastes generated through their activities at certified landfills off-post. All waste diversion must be reported (Army 2015a).

The majority of the everyday waste produced on Fort Wainwright is collected by contractors and taken to the FNSB South Cushman municipal landfill. This landfill opened in 2000 and has an estimated closure date of 2060. For fiscal year (FY) 2014, the installation disposed of approximately 2,340 tons of solid waste into the municipal landfill (Army 2015a). This landfill is permitted by the ADEC until January 14, 2022 (permit number: SWRDD003-22) (ADEC 2019b).

USAG Alaska operates an on-post landfill, which was used until 2000 for the disposal of all solid waste generated on the installation. It is now used only for less than 10 cubic yards per project of friable asbestos waste, and coal ash from the CHPP. The amount of solid waste disposed of at this certified landfill annually dropped to less than 4,000 tons in FY 2013 (Army 2015a). The installation's landfill is permitted by the ADEC until August 31, 2021 (permit number: SW1A003-21) (ADEC 2019c), when the solid waste permit would need to be renewed.

Coal ash is a byproduct of the coal combustion process in the CHPP. The coal ash is collected by a vacuum system from the bottom of the boilers and inside the baghouse and is temporarily stored in two silos before being transported by truck to the installation's landfill (USACE 2007). The trucks dump the ash into piles within dedicated coal ash disposal areas of the landfill (ADEC 2019c).

3.3.2 Environmental Consequences

3.3.2.1 Significance Criteria

A significant impact on utilities could result if the Army action were to result in either of the following:

- Result in energy demands that exceed capacity of existing infrastructure or the generating capacity of a specific utility
- Cause frequent or long-term impairment of utility service to local communities

3.3.2.2 No Action Alternative

USAG Alaska would not upgrade the heat and electrical generation and distribution infrastructure. The existing CHPP would remain in service even though it is one of the oldest operational coal-fired power plants in the United States. Maintenance would continue to be performed, as needed; however, the plant would continue to deteriorate, and potentially result in a catastrophic heat and/or electrical failure. Such inaction could jeopardize the sustainment of the military mission on Fort Wainwright and is a long-term, significant, adverse effect. Short-term, minor impacts would be expected during maintenance activities.

No changes to the installation's demand for coal would occur. Under existing conditions, about 60 percent of fuel energy is lost by the time coal energy is converted to either usable steam energy or useful electricity (Guernsey 2015, USACE 2018). The existing CHPP has an overall system efficiency (amount of fuel energy converted to heat or electricity) of about 42 percent (USACE 2018). Although the implementation of BACT would improve operations, the CHPP would continue to operate at reduced capacity. A local coal provider has sufficient reserves to maintain current operations at the CHPP for a minimum of 50 years. No changes to the installation's demand for electricity would occur. The majority of electricity needed for the installation would continue to be produced at the CHPP and the remainder would continue to be purchased from the local electric provider. The local electric provider would continue to provide a contingency power supply should the CHPP be unable to generate electricity. Fort Wainwright would continue to not require natural gas, and liquid fuels would continue to be delivered to the installation for their current purposes (i.e., automobile and aircraft fueling, emergency electricity generators, emergency fire pump engines, and four backup boilers in two mission critical buildings) with no change in demand. No changes to water, wastewater, and solid waste disposal services would occur. Coal ash from the CHPP would continue to be disposed of in the installation's Permitted Class 1 unlined landfill with no change to the amount of ash produced.

3.3.2.3 Alternative 1 (Build a New Coal CHPP)

Heating Infrastructure

Long-term, significant, beneficial impacts on Fort Wainwright's CHPP, steam distribution system, and utilidors would occur. USAG Alaska would continue to operate an onsite, coal-fired CHPP to generate steam heat and electricity; however, the existing CHPP would be retired, demolished, and replaced with an entirely new, coal-fired CHPP. The boilers of the existing CHPP would be deactivated and replaced with new boilers of similar heat capacity.

Coal would continue to be used as the fuel source for the new CHPP. A minor reduction in the demand for coal would be possible because the new CHPP would be more efficient and could require less fuel (about 30 percent less coal) than the existing CHPP (USACE 2018). The new CHPP would have an overall system efficiency of about 53 percent (compared to 42 percent); about 47 percent of fuel energy would be lost before being converted to heat or electricity (USACE 2018). A local coal provider would continue to supply Fort Wainwright with coal, and coal would continue to be transported by rail to the installation. At minimum, a 14-day supply of coal would be stored on the installation; however, the actual supply of coal would likely be similar to current practices, which is typically a 90-day supply.

A new CHPP would require substantial investment to upgrade the steam distribution system within the utilidors. Fort Wainwright's upgraded steam and condensate mains would continue to distribute steam heat to the buildings on the installation. Repairs to other mains, particularly those within older utilidors, would be performed as needed. Brief, local heat interruptions may occur during non-peak periods (e.g., summer) when these repairs are made.

Construction contractors would be informed of utility locations prior to any ground-disturbing activities that would result in unintended utility disruptions or human safety hazards. All construction activity would be conducted in accordance with federal and state safety guidelines. Any permits required for excavation and trenching would be obtained before construction activities begin.

Overall, the replacement of the aging, inefficient CHPP with a new, modern, efficient CHPP would improve the reliability of the building heating infrastructure on Fort

Wainwright and lessen the potential for a service failure. Given the subarctic climate of the Fairbanks region, the installation's building heating infrastructure is crucial to the sustainment of the military mission on Fort Wainwright.

Electricity

Short-term, negligible, adverse impacts and long-term, moderate, beneficial impacts on Fort Wainwright's electrical infrastructure would occur. The short-term impacts would result from a slight increase in the demand for electricity for construction purposes during construction of the new CHPP and demolition of the existing CHPP. Construction of the new CHPP would last for approximately two to three construction seasons, and the installation's electrical demand would return to preconstruction levels at the conclusion of construction. No long-term changes to the overall demand for electricity on the installation would occur.

The long-term impacts would result from improved reliability of electric generation for Fort Wainwright and lessened potential for a service failure. Fort Wainwright would generate the majority of the electricity it needs using the new CHPP. The balance of the electrical demand would continue to be purchased from the local electric provider. The local electric provider would continue to provide a contingency power supply should the CHPP be unable to generate electricity. The installation's existing electric distribution system would remain in service, and the only appreciable service expansions needed would be to move existing circuits and switchgear from the existing CHPP to the new CHPP. No major power outages would be anticipated. The emergency electricity generators installed in mission-critical facilities across the installation would remain so that mission operations would be sustained during potential outages of electricity from both CHPP and local service provider sources.

Natural Gas

Natural gas would still be used in the Siku Basin Housing Area on the Fort Wainwright Main Post. No additional natural gas sources would be required because the new CHPP would be coal-fired.

Liquid Fuels

Short-term, negligible, adverse impacts on liquid fuels would occur. Contractors would obtain and use liquid fuels, mainly ULSD and gasoline, for the vehicles and equipment needed to construct the new CHPP and demolish the existing CHPP. The amount of liquid fuels used each day for construction would be negligible in comparison to that used in the Fairbanks region, and there is ample supply available to meet this temporary (i.e., one or two construction seasons) increase in liquid fuel demand.

No long-term impacts on liquid fuels would occur. The new CHPP would be coal-fired; therefore, no long-term change in the demand for liquid fuels, including ULSD, would occur. No changes would occur to the amounts of liquid fuels delivered for automobile and aircraft fueling, emergency electricity generators, emergency fire pump engines, and four backup boilers in two mission-critical buildings.

Water

Short-term, negligible, adverse impacts on Fort Wainwright's water infrastructure would occur. These impacts would result from a slight increase in the demand for water during construction of the new CHPP and demolition of the existing CHPP. This increase in water demand would be temporary (i.e., two to three construction seasons) and within the available capacity of Fort Wainwright's water system. The installation's long-term demand for water for potable and fire protection purposes would not change, and overall CHPP water use would likely go down by 5 to 10 percent because the existing CHPP's cooling system using would no longer require as much water. The decrease in water demand would result in long-term, minor, beneficial impacts. Fort Wainwright's existing water distribution system would remain in service. Because the utilidors would continue to be heated using the steam distribution system, the water distribution pipes would not freeze. No water service interruptions would be anticipated.

Wastewater

Short-term, negligible, adverse impacts on Fort Wainwright's wastewater infrastructure would occur. These impacts would result from a slight increase in the amount of wastewater generated during construction of the new CHPP and demolition of the existing CHPP. This increase in wastewater generation would be temporary (i.e., one or two construction seasons) and within the available capacity of Fort Wainwright's wastewater system. In the long-term, the volume of wastewater transported for disposal would not change. Fort Wainwright's existing wastewater system would remain in service. Because the utilidors would continue to be heated using the steam distribution system, the wastewater lines would not freeze. No wastewater service interruptions would be anticipated.

Solid Waste Management

Short-term, minor, adverse impacts on solid waste management would occur. These impacts would result from the construction and demolition waste produced during construction of the new CHPP and demolition of the existing CHPP. Contractors would be responsible for the disposal of most construction and demolition waste in landfills off-post. If more than 10 cubic yards of asbestos waste was produced from the demolition of the existing CHPP or upgrades to the steam and condensate mains, it would be disposed in a certified off-post landfill. Less than 10 cubic yards could be disposed of in the on-post landfill. Construction would last for approximately one or two construction seasons. No construction and demolition waste would be produced following the conclusion of construction.

No new long-term impacts on solid waste management would occur. The new CHPP would produce coal ash similar to the existing CHPP. A minor reduction in the amount of coal ash produced would be possible because the new CHPP would be more efficient and could consume less coal than the existing CHPP. The coal ash would continue to be disposed of in the installation's Permitted Class 1 unlined landfill. It is possible the installation's landfill could reach capacity in the future. If the landfill were to reach capacity, under the UPC, the System Owner would be responsible for coal ash disposal off the installation.

3.3.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Heating Infrastructure

Similar to Alternative 1, long-term, significant, beneficial impacts on Fort Wainwright's CHPP, steam distribution system, and utilidors would occur. USAG Alaska would continue to operate an onsite CHPP to generate steam heat and electricity; however, the existing, coal-fired CHPP would be retired, demolished, and replaced with an entirely new, dual-fuel combustion turbine generator CHPP. The boilers of the existing CHPP would be deactivated. The new CHPP would use three 7-MW gas turbines and three supplemental duct-fired HRSGs.

The new CHPP would be more efficient than the existing system (58 percent overall efficiency compared to 42 percent [USACE 2018]). The primary fuel source for the new CHPP would be natural gas, and ULSD would be the secondary fuel source (see subsections below for impacts on these fuel sources). Once the existing CHPP is retired, the installation's demand for coal would conclude, and no further rail deliveries of coal would be necessary.

Similar to Alternative 1, substantial investments would be necessary to upgrade the steam distribution system within the utilidors. Fort Wainwright's upgraded steam and condensate mains would continue to distribute steam heat to buildings on the installation. Repairs to other mains, particularly those within older utilidors, would be performed as needed. Brief, local heat interruptions may occur during non-peak periods (i.e., summer) when these repairs are made.

Overall, the replacement of the aging, inefficient CHPP with a new, modern, efficient CHPP would improve the reliability of the building heating infrastructure on Fort Wainwright and lessen the potential for a service failure. Given the subarctic climate of the Fairbanks region, the installation's building heating infrastructure is crucial to the sustainment of the military mission on Fort Wainwright.

Electricity

Short-term, negligible, adverse impacts and long-term, moderate, beneficial impacts on Fort Wainwright's electrical infrastructure would be identical to those for Alternative 1.

Natural Gas

Long-term, moderate, adverse and beneficial impacts on natural gas production, delivery, and distribution would occur because the dual-fuel CHPP would use natural gas as its primary fuel source. USAG Alaska would execute a contract to supply the installation with uninterrupted natural gas service. Because natural gas is only used in the Siku Basin Housing Area on the Fort Wainwright Main Post, a natural gas supply pipeline would need to be constructed between the existing natural gas distribution main and the new CHPP.

Alaska has sufficient availability of natural gas to meet the CHPP's demand; however, operation of the dual-fired CHPP would substantially increase the regional demand for natural gas, which would constitute a long-term, moderate, adverse impact because only limited natural gas storage and distribution infrastructure is available in the Fairbanks region. In addition to the increased demand placed on the production and liquefaction facilities at Cook Inlet, the number of LNG truck deliveries to the Fairbanks region would increase. It is anticipated that a 14-day supply of LNG would be contracted for and stored locally off the post. The local natural gas provider might also need to construct additional LNG storage capability and regasification infrastructure to support the increased demand from the CHPP. On-post storage of gaseous natural gas or LNG and regasification would not occur. Given the history and reliability of natural gas and its infrastructure as s a fuel source, the risk for potential accidents would be low.

ULSD would be used as the secondary fuel source for the CHPP and to sustain heat and electric generation operations should a natural gas service failure occur. It is possible that natural gas service would not be available for Fort Wainwright when the CHPP is commissioned. In this event, ULSD would be used as the only fuel source until natural gas service is available. The expansion of natural gas storage and distribution infrastructure in the Fairbanks region is a long-term, moderate, beneficial impact because it would improve the condition and extent of the natural gas delivery infrastructure and possibly allow additional new customers to connect to this fuel source. Construction of the natural gas supply pipeline to Fort Wainwright would be coordinated with existing utilities to ensure placement does not conflict with existing utility services.

Liquid Fuels

Short-term, negligible, adverse impacts on liquid fuels would be identical to those for Alternative 1 as contractors obtain and use liquid fuels for their construction equipment.

Long-term, minor to moderate, adverse impacts on liquid fuels would occur. USAG Alaska (by way of DLA) would contract with a local provider to supply sufficient ULSD to sustain operation of the dual-fuel CHPP and maintain a minimum of a 14-day supply. Although natural gas would be the primary fuel source for the CHPP and ULSD would be used should a natural gas service failure occur, ULSD could be used exclusively, if needed. ULSD might be used exclusively should natural gas service not be available for Fort Wainwright when the CHPP is commissioned.

Operation of the new CHPP exclusively using ULSD would require approximately 20 million gallons per year, which is equal to approximately 1,300 barrels per day. By comparison, this is approximately 3.9 percent of Alaska's current liquid fuel demand (Black and Veatch 2018). This increase in the state's liquid fuel demand would constitute a long-term, minor to moderate, adverse impact because Alaska has sufficient in-state refining and import infrastructure to meet such an increase but additional ULSD storage capacity may need to be constructed in the Fairbanks region so that local suppliers can meet the increased delivery demand. Sufficient ULSD storage capacity would be constructed on Fort Wainwright to sustain at least 14 days of uninterrupted operations. An increase in the number of rail or truck deliveries of ULSD to the Fairbanks region may occur, and an increase in the number of truck deliveries of ULSD to Fort Wainwright would occur.

No changes would occur to the amounts of liquid fuels delivered for automobile and aircraft fueling, emergency electricity generators, emergency fire pump engines, and four backup boilers in two mission-critical buildings.

Water

Short-term, negligible, adverse impacts on Fort Wainwright's water infrastructure from construction of the new CHPP, extension of natural gas service to the new CHPP, and demolition of the existing CHPP would be identical to those for Alternative 1. The installation's long-term demand for water for potable and fire protection purposes would not change, and overall CHPP water use would decline, resulting in long-term, moderate, beneficial impacts.

Wastewater

Short-term, negligible, adverse impacts on Fort Wainwright's wastewater infrastructure from construction of the new CHPP, extension of natural gas service to the new CHPP, and demolition of the existing CHPP would be identical to those for Alternative 1. In the long-term, the volume of wastewater transported for disposal would not change.

Solid Waste Management

Short-term, minor, adverse impacts on solid waste management from construction of the new CHPP, extension of natural gas service to the new CHPP, and demolition of the existing CHPP would be identical to those for Alternative 1.

Long-term, moderate, beneficial impacts on solid waste management would occur. Operation of the new CHPP would not produce coal ash as solid waste because it would burn natural gas and liquid fuels rather than coal. As a result, USAG Alaska would no longer need to dispose of coal ash in a landfill.

3.3.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Heating Infrastructure

Unlike Alternatives 1 and 2, Fort Wainwright would gradually transition from a CHPP that generates steam heat and electricity for the installation to distributed natural gas boilers that would be located in various buildings across the installation to produce heat. Electricity would be purchased from a local electric provider. The transition would take several years to complete, and buildings would be gradually removed from the steam distribution system and connected to the boilers. Once all buildings have been removed from the steam distribution system, the existing, coal-fired CHPP would be retired and demolished. The installation's demand for coal would conclude, and no further rail deliveries of coal would be necessary.

Some of Fort Wainwright's existing steam and condensate mains—especially those within utilidors that house water distribution and wastewater collection pipes—would remain in service even though these steam mains would no longer be connected to buildings. These steam mains provide vital heat to the utilidors to prevent the water distribution and wastewater collection mains from freezing, and methods would be installed to continue to avoid freeze-up. Repairs to some mains, particular those within older utilidors, would continue to be performed as needed. Brief, local heat interruptions may occur during non-peak periods (e.g., summer) when these repairs are made.

The new natural gas boilers would be substantially more efficient than the existing system (75 percent efficiency compared to 42 percent [USACE 2018). Approximately 25 percent of the fuel energy would be lost prior to producing heat under Alternative 3 (USACE 2018). Overall, the replacement of the aging, inefficient CHPP with new, modern, efficient distributed natural gas boilers would improve the reliability of the building heating infrastructure on Fort Wainwright and avoid the potential of an installation-wide service failure from a central heat source. This would be a long-term, significant, beneficial impact. Given the subarctic climate of the Fairbanks region, the installation's building heating infrastructure is crucial to the sustainment of the military mission on Fort Wainwright.

Electricity

Like Alternatives 1 and 2, short-term, negligible, adverse impacts on Fort Wainwright's electrical infrastructure would occur from a slight increase in the demand for electricity for construction purposes during installation of the distributed boilers, construction of the new building space to house the boilers, extension of natural gas service to and on the installation, and demolition of the existing CHPP. Compared to Alternatives 1 and 2, construction would occur at many more buildings on the installation and for a longer period. As a result, the installation's electrical demand may be slightly elevated for several construction seasons before returning to preconstruction levels. No long-term changes to the overall demand for electricity on the installation would occur.

Following the deactivation of the CHPP, USAG Alaska would purchase all electrical power for the installation from a local electric service provider. The installation already has the necessary circuits from the local provider to supply the installation with 21 MW of peak electrical demand; however, these circuits would need to be relocated from the existing CHPP to a new building. The installation's existing electric distribution system would remain in service, and no service expansions would occur. No power outages would be anticipated.

Use of a local electric service provider rather than the existing CHPP would improve the reliability of electric service and lessen the potential for a service failure on Fort Wainwright because the installation would no longer be dependent on older electric generation infrastructure but would rely on newer infrastructure that services the entire Fairbanks region. Two 10-MW ULSD fuel backup generators at the installation's main substation could provide backup power to the entire installation should a regional service disruption occur. USAG Alaska would also install additional emergency electricity generators in mission-critical buildings as required so that mission operations would be sustained during electrical outages. These emergency generators would be fueled with ULSD, and the installation would have sufficient fuel storage capacity to operate them for at least 14 days.

Natural Gas

Like Alternative 2, long-term, moderate, adverse and beneficial impacts on natural gas production, delivery, and distribution would occur. USAG Alaska would contract with a local utility provider to supply the installation with uninterrupted natural gas service because the distributed boilers would use natural gas as their fuel source and natural gas is currently only used in limited quantities at the Siku Basin Housing Area on the Fort Wainwright Main Post. A natural gas supply pipeline would be constructed between an existing off-post natural gas distribution main and a central point on the installation and an installation-wide natural gas distribution network would be constructed from the central point to each boiler. On-post storage of gaseous natural gas or LNG and regasification would not occur.

The demand for natural gas using the distributed natural gas boilers would be similar to that from the dual-fuel CHPP under Alternative 2 (Black and Veatch 2018). Alaska has sufficient availability of natural gas to meet this demand; however, increased demand would be placed on the production and liquefaction facilities at Cook Inlet and the number of LNG truck deliveries to the Fairbanks region would increase. The natural gas storage and distribution infrastructure in the Fairbanks region may need to be expanded by constructing additional LNG storage capability and regasification infrastructure to support the increased demand from the distributed boilers. The expansion of natural gas storage and distribution infrastructure in the Fairbanks region is a long-term, moderate, beneficial impact because it would improve the condition and extent of the natural gas delivery infrastructure and possibly allow additional new customers to connect to this fuel source. Construction of the natural gas supply pipelines to and on Fort Wainwright would be coordinated with existing utilities to ensure placement does not conflict with existing utility services.

Liquid Fuels

Like Alternatives 1 and 2, short-term, negligible, adverse impacts on liquid fuels would occur as contractors obtain and use these liquid fuels for their construction equipment. Compared to Alternatives 1 and 2, construction would occur at many more buildings on the installation and for a longer period; however, the amount of liquid fuels used each day for construction would remain negligible in comparison to that used in the Fairbanks region, and there is ample supply available to meet this temporary (i.e., several construction seasons) increase in liquid fuel demand.

Long-term, minor, adverse impacts on liquid fuels would occur. Although the distributed natural gas boilers would generally not have dual-fuel capability, USAG Alaska would install ULSD-fueled reciprocating internal combustion engines to provide emergency electricity and heat for the boilers so that operations would be sustained during an electricity or natural gas outage. Mission-critical facilities would have dual-fuel boilers. USAG Alaska (by way of the DLA) would contract with a local provider to supply the installation with sufficient ULSD to operate these boilers for at least 14 days.

A slight increase in the state's demand for ULSD would occur from operating the boilers. Alaska has sufficient in-state refining and import infrastructure to meet such an increase. Additional ULSD storage capacity may need to be constructed in the Fairbanks region so that local suppliers can meet the increased delivery demand. Sufficient ULSD storage capacity would be constructed on Fort Wainwright to sustain the engines for at least 14 days of uninterrupted operations. An increase in the number of rail or truck deliveries of ULSD to the Fairbanks region may occur, and an increase in the number of truck deliveries of ULSD to Fort Wainwright would occur. The ULSD storage volume and delivery frequency requirements would be far less than those for Alternative 2.

No changes would occur to the amounts of liquid fuels already delivered to the installation for automobile and aircraft fueling, emergency electricity generators, emergency fire pump engines, and four backup boilers in two mission-critical buildings.

Water

Like Alternatives 1 and 2, short-term, negligible, adverse impacts on Fort Wainwright's water infrastructure would occur from a slight increase in the demand for water for construction purposes during installation of the distributed boilers, construction of the new building space to house the boilers, extension of natural gas service to and on the installation, and demolition of the existing CHPP. Compared to Alternatives 1 and 2, construction would occur at many more buildings on the installation and for a longer period. As a result, the installation's water demand may be slightly elevated for several construction seasons before returning to preconstruction levels; however, the increase demand for water would remain within the available capacity of Fort Wainwright's water system. The installation's long-term demand for water for potable and fire protection purposes would decrease because the CHPP would no longer be in operation, resulting in long-term, moderate, beneficial impacts.

Fort Wainwright's existing water distribution system would remain in service. USAG Alaska would design and implement freeze protection provisions to ensure that existing water and wastewater pipelines within the utilidors do not freeze. No water service interruptions would be anticipated.

Wastewater

Like Alternatives 1 and 2, short-term, negligible, adverse impacts on Fort Wainwright's wastewater infrastructure would occur from a slight increase in the amount of wastewater generated for construction purposes during installation of the distributed boilers, construction of the new building space to house the boilers, extension of natural gas service to and on the installation, and demolition of the existing CHPP. Compared to Alternatives 1 and 2, construction would occur at many more buildings on the installation and for a longer period. As a result, the installation's wastewater volume may be slightly elevated for several construction seasons before returning to preconstruction levels; however, the increase wastewater volume would remain within the available capacity of Fort Wainwright's wastewater system. The amount of wastewater generated on the installation would decrease over the long-term, however, given that less water would be used for CHPP system cooling and released into wastewater once the CHPP is no longer operating. Therefore, Alternative 3 would result in a long-term, moderate, beneficial impact on production and waste over the long-term.

Fort Wainwright's existing wastewater collection system would remain in service. Because more than two-thirds of the installation's wastewater collection system is located within the utilidors and currently relies on heat from the steam distribution system to prevent freezing, USAG Alaska would design and implement a freeze protection provision to ensure that existing water and wastewater pipelines do not freeze. No wastewater service interruptions would be anticipated.

Solid Waste Management

Similar short-term, minor, adverse impacts on solid waste management as for Alternatives 1 and 2 would occur from installation of the distributed boilers, construction of the new building space to house the boilers, extension of natural gas service to the new CHPP, and demolition of the existing CHPP. Compared to Alternatives 1 and 2, construction would occur at many more buildings on the installation and for a longer period. As a result, the amount of construction and demolition waste would be greater, and construction and demolition waste would be produced for several construction seasons.

Long-term, moderate, beneficial impacts on solid waste management would be identical to those for Alternative 2 would occur because the distributed boilers would not produce coal ash as solid waste.

3.4 Hazardous and Toxic Materials and Wastes

3.4.1 Affected Environment

The potential impacts hazardous materials and hazardous waste can have on human health and the environment largely depend on their types, quantities, toxicities, and associated management practices. The ROI for the Proposed Action includes the Main Cantonment Area.

3.4.1.1 Definition of Resource

Hazardous Materials

Hazardous and toxic materials or substances are those that pose a risk to human health or the environment. Hazardous materials are defined by 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173.

Hazardous Waste

Hazardous wastes are defined by the RCRA at 42 U.S.C. § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Examples of hazardous waste present on Fort Wainwright may include solvents, antifreeze, deicing fluids, petroleum products such as oils, hydraulic oils, grease, and fuels, as well as paints and batteries.

Hazardous wastes may not be limited to chemical products, and can also include items such as pressurized cylinders and medical/biohazards.

Underground Storage Tanks and Aboveground Storage Tanks

Underground storage tanks (USTs) and aboveground storage tanks (ASTs) are used to store large quantities of hazardous liquids, such as petroleum, oils, and lubricants (POL). The Leaking Underground Storage Tank Trust Fund addresses petroleum releases from federally regulated USTs.

Asbestos-Containing Material (ACM)

Asbestos is a naturally occurring fibrous mineral, and the most common types of asbestos are chrysotile (white) and amosite (brown/off-white). Because it is fire-resistant, resists many chemicals, and is an excellent insulator, asbestos was added to a variety of building materials and other products and was routinely used in buildings constructed before 1980. Disturbing ACMs can release tiny fibers into the air. People who breathe asbestos fibers over many years can develop asbestos-related diseases, including asbestosis, lung cancer, and mesothelioma. Some of these diseases can be serious or fatal (Agency for Toxic Substances and Disease Registry [ATSDR 2016]). Because of these health dangers, the EPA and other agencies have implemented laws and regulations to protect people from asbestos exposure. The EPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM. ACMs are generally found in building materials such as floor tiles, mastic, roofing materials, pipe wrap, and wall plaster.

ACM and ACM abatement are regulated by the EPA and the Occupational Safety and Health Administration (OSHA). Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the CAA, which established the National Emission Standards for Hazardous Air Pollutants (NESHAP). Under NESHAP, the owner of a structure must, before demolition or renovation of buildings with ACM, provide notice to the regulator with CAA authority (either the EPA or its state counterpart). The NESHAP regulations (40 CFR Part 61) address the demolition or renovation of buildings with ACM. OSHA Standard 1910-1001 addresses protection of workers working around asbestos; OSHA Standard 1910-1101 addresses workers that actively remove ACM. The Asbestos Hazard Emergency Response Act, Public Law (P.L.) 99-519, and P.L. 101-637 address worker protection for employees who work around or remediate ACM. The 2007 USAG Fort Wainwright Asbestos Management Plan (USAG Fort Wainwright 2007a) provides additional guidance for ACM management, abatement, and removal in accordance with Army Regulation (AR) 200-1, NESHAP, and Army regulations. ACMs are also regulated by the TSCA.

Radon

Radon is a naturally occurring odorless and colorless radioactive gas found in soils and rocks that can lead to the development of lung cancer. Radon tends to accumulate in enclosed spaces, usually those that are below ground and poorly ventilated (e.g., basements). EPA established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences, and radon levels above this amount are considered a health risk to occupants.

Lead-Based Paint (LBP)

Human exposure to lead has been determined by agencies such as the OSHA and EPA to pose an adverse health risk. Sources of exposure to lead are dust, soils, paint, and many surface coatings. LBP was used as coatings and finishes before the hazards associated with lead accumulation in children were identified. In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. The use of LBP declined after 1978 when the CPSC lowered the allowable lead content in paint to 0.06 percent by weight from its 1973 level of 0.5 percent. This change was made under the Consumer Safety Act of 1977, P.L. 101-608, as implemented by 16 CFR Part 1303.

Each installation must develop and implement a management plan for identifying LBP, risk assessment, worker safety, worker training and certification, and identification, evaluation, management, and abatement of LBP hazards in accordance with AR 420- 70, *Facilities Engineering, Building and Structures*. The 2007 USAG Fort Wainwright Lead Based Paint Management Plan (USAG Fort Wainwright 2007b) provides guidance for LBP removal for Fort Wainwright and requires that LBP removal be conducted in accordance with applicable TSCA, OSHA, and Army regulations. Activities such as sanding, scraping, manual demolitions, abrasive blasting, cutting, torching, or welding of LBP are trigger tasks that can result in significant worker and community exposures; therefore, all demolition or renovation projects are subject to the requirements of this plan.

Polychlorinated Biphenyls (PCBs)

PCBs are a group of man-made organic chemicals that persist in the environment and were widely used in building materials (e.g., caulk) and electrical products before 1979. The EPA classifies PCBs as a probable human carcinogen, and PCBs have been demonstrated to cause a variety of other serious adverse health effects. Although PCBs are no longer produced in the United States, human exposure can still occur (EPA 2020b). Structures constructed prior to 1979 potentially include PCB-containing building materials. Construction materials such as paints, caulking, and mastics and other adhesives, as well as ceiling tiles, acoustic boards, fireproofing materials, high-intensity discharge lamp ballast capacitors, and the capacitors of fluorescent light ballasts sometimes contain PCBs. Such PCB-containing materials can also contaminate adjacent wood or masonry surfaces.

The disposal of PCBs is regulated under the federal TSCA (15 U.S.C. § 2601 et seq., as implemented by 40 CFR Part 761), which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. By federal definition, PCB equipment contains 500 ppm PCBs or more; PCB-contaminated equipment contains PCB concentrations equal to or greater than 50 ppm, but less than 500 ppm; and PCB items contain from 5 to 49 ppm PCBs. TSCA regulates, and the EPA enforces, the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

Unexploded Ordnances (UXOs)

UXOs are explosive weapons, including bombs, shells, grenades, land mines, naval mines, cluster munition, and other ordnance, that did not explode when they were employed and have never been detonated.

Petroleum, Oil, and Lubricants (POL)

Petroleum products include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Hazardous Substances Regulated by the Emergency Planning and Community Right-to-Know Act (EPCRA)

EPCRA establishes requirements for federal, state, and local governments; Indian tribes; and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The four major provisions of EPCRA include emergency planning, emergency release notification, hazardous chemical storage reporting requirements, and toxics release inventory.

Hazardous Substances Regulated by the Resource Conservation and Recovery Act

The USAG Alaska must manage its hazardous materials and wastes in accordance with the RCRA, as amended by the Hazardous and Solid Waste Amendments to comply with federal regulations. In accordance with the RCRA, Fort Wainwright is registered with the EPA under the facility identification number AK6210022426. The USAG Alaska must also comply with military regulations, state regulations, and employee safety standards for hazardous materials and wastes.

3.4.1.2 Environmental Laws, Regulations, and Executive Orders

Hazardous materials and wastes are defined and regulated at the federal and state levels and by the Army. AAC, Title 18, Environmental Conservation, contains the criteria for management, generation, transport, and disposal of hazardous materials and waste. AR 200-1 implements federal, state, and local environmental laws and DoD policies for preserving, protecting, conserving, and restoring the quality of the environment. Developed in accordance with AR 200-1, the USAG Regulation 200-1 pamphlet provides guidance for the management of hazardous materials/regulated waste by both military and civilian personnel at all USAG Alaska facilities, including Fort Wainwright (USAG Fort Wainwright 2013a). The Army, EPA, and the State of Alaska have signed Federal Facility Agreements for Fort Wainwright. These agreements outline institutional controls, which are administrative measures to control property access and usage and are applicable to known or suspected contaminated sites within Fort Wainwright. These institutional controls (e.g., limitations on the location and depth of excavations, water use, property transfer agreement restrictions, etc.) are designed to supplement active contaminant reduction and remediation actions, as appropriate, for short-term and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants and safeguard human health and safety and environmental resources.

Such control programs in place at Fort Wainwright include the RCRA; CERCLA; Defense Environmental Restoration Account; Defense Environmental Restoration Program (DERP); Installation Restoration Program (IRP); and Military Munitions Response Program (MMRP). These programs, along with any current EOs, are the basis for the storage, handling, and maintenance of hazardous wastes, as well as the directives for funding and restoration of previously contaminated sites.

The 2018 USAG Fort Wainwright Spill Prevention, Control, and Countermeasure (SPCC) Plan, in accordance with the Oil Pollution Act, documents facility information, petroleum storage information, calculates potential for future spills, and outlines procedures for preventing and managing hazardous spills that may occur at the installation (DLA Energy 2018).

Contaminated and potentially contaminated sites are regulated by CERCLA. CERCLA, as amended by the Superfund Amendments and Reauthorization Act, oversees long- and short-term remediation actions for contaminated or potentially contaminated sites by requiring investigation, assessment, and development of remediation programs to contain contamination. The State of Alaska also oversees the DoD CERCLA sites through implementation of ADEC regulatory responsibilities of oversight on contaminated site cleanup work to ensure that sites are cleaned up to meet state standards and to protect human health, safety, welfare, and the environment.

The DERP was established to provide for the cleanup of active military installations and formerly used defense sites throughout the United States and its territories. The two restoration programs under the DERP are the IRP and the MMRP. The IRP addresses removal and remediation actions at contaminated sites, and the MMRP addresses nonoperational military ranges and other sites suspected or known to contain UXO, discarded military munitions, or munitions constituents. Each site is investigated and appropriate remedial actions are taken under the supervision of applicable federal and state regulatory programs. When no further remedial action is necessary for a given site, the site is closed and it no longer represents a threat to human health.

Additionally, Fort Wainwright maintains its Environmental Management System, which outlines practices for sustainable acquisition and building, repurposing when applicable, recycling programs, and energy and water conservation.

3.4.1.3 Current Condition

The Army began its investigation of contaminated areas at Fort Wainwright in 1989. The EPA listed Fort Wainwright as a site on the National Priorities List in 1990. The National Priorities List specifies national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The Army signed a Federal Facilities Agreement with the EPA and the State of Alaska in 1992 to address contamination. In 2002, USAG Alaska completed construction of all systems necessary for site cleanup

(USAG Fort Wainwright 2013a). The Army continues to perform active remediation and groundwater monitoring, enforce land use controls, conduct inspections, and consider possible additional cleanup options.

There are 53 IRP sites at Fort Wainwright. At these sites, the primary contaminants of concern include metals, pesticides, POL, PCBs, semivolatile organic compounds, and VOCs in the installation's groundwater and soil (USAG Fort Wainwright 2016, 2020).

Groundwater in the Fort Wainwright area has relatively high, naturally occurring levels of metals, especially iron and arsenic. In addition, groundwater contamination from historical Army-related industrial activities exists in the Main Post area and is commonly associated with leaking underground storage tanks (LUSTs), chemicals storage facilities, and chemicals dump areas. Groundwater contamination is generally localized, and there is no indication of deep groundwater pollution. Intensive monitoring and remediation of the areas of contaminated groundwater are being implemented through projects under CERCLA (USAG Fort Wainwright 2013a).

USAG Alaska actively manages use of hazardous materials and generation of hazardous waste through the development and implementation of plans to eliminate or reduce products that pose environmental risk. Any project that involves excavation or movement of soils must include field screening for petroleum products (plus any other identified contaminants). Soils exhibiting readings less than 20 ppm are considered clean and may be reused on site or disposed of in accordance with the scope of work for the specific project (USAG Fort Wainwright 2013a).

In the area immediately surrounding the existing CHPP, the following are active remediation sites: (1) Fort Wainwright Building 3562 PX Gas Station USTs 177, 179, and 180, CC-FTWW-086; (2) Fort Wainwright (2P) Building 3570, Former PX Gas FTWW-101; (3) Fort Wainwright Building 3564, Diesel Electric Generation Plant FTWW-099; (4) Fort Wainwright Doyon Clear Well Repair Project; and (5) Fort Wainwright (OU-4) FTWW-011, Coal Storage Yard.

Hazardous Materials

The three turn-in facilities for hazardous wastes and materials include the Hazardous Materials Control Center at Building 3030, DLA – Disposition Services at Fairbanks Environmental Branch, and the Hazardous Waste Management Contractor at Building 3489. The Logistics Readiness Center manages the Hazardous Materials Control Center and is also responsible for monitoring the use of hazardous materials. The DLA – Disposition Services is responsible for determining hazardous material sale or reuse and disposing of hazardous waste off the installation. The Hazardous Waste Management Contractor is responsible for providing hazardous waste identification labels for each hazardous materials accumulation container and establishing a pickup of contracted waste with the Defense Reutilization Marketing Office (USAG Fort Wainwright 2016).

Standard operating procedures (SOPs) are currently used at Fort Wainwright, both by installation personnel and third-party contractors, to minimize and prevent adverse impacts on human health and the environment by the use, handling, and storage of hazardous materials. Use and handling of hazardous materials may occur during construction projects, remediation of existing known contaminant sources, general management, and control and storage of new and spent materials. In general, hazardous materials are handled in accordance with all applicable local and state laws governing the proper use, handling, and disposal of such materials (USAG Fort Wainwright 2017a).

Hazardous Waste

Fort Wainwright is a permitted Large Quantity Generator (LQG) of Hazardous Waste. LQGs generate 1,000 kilograms (kg) per month or more of hazardous waste or more than 1 kg per month of acutely hazardous waste. Waste streams include wastes from the motor pool, hospital, hangars, and power plant, such as used rifle bore patches/wadding, used batteries, used solvents, contaminated or excess fuels, used antifreeze, used oil, spill cleanup materials, and contaminated soil. These wastes are accumulated temporarily at the generating facilities in accumulation points, such as hazardous waste satellite accumulation areas or hazardous waste accumulation sites. Appropriate Army personnel transport accumulated hazardous wastes off the installation. Medical and biohazard wastes are handled separately by the hospital. The installation power plant also manages its own hazardous waste streams (USAG Fort Wainwright 2017a).

The installation also utilizes third-party consultants as hazardous waste management services contractors, who are responsible for management of hazardous waste accumulation facilities and the identification, consolidation, packaging, and transportation of hazardous wastes in support of installation missions (USAG Fort Wainwright 2017a).

Fort Wainwright has one Class I landfill, which is authorized to accept municipal solid wastes, inert waste, sewage solids, regulated ACM, non-regulated ACM, and coal ash; however, this landfill does not have the capacity for accepting and storing hazardous materials other than ACM and coal ash. ADEC completed a compliance visit to the landfill in October 2018, and the landfill received a score of 96 out of 100, indicating that the landfill scored highly with regard to ADEC standards (ADEC 2018b). A portion of the landfill no longer accepts any wastes and is closed and covered. Groundwater downgradient from the closed portion is sampled for mercury and arsenic, which are contamination constituents in coal ash. In the most recent verified results from 2018, mercury was reported below ADEC cleanup levels. Arsenic was detected as exceeding cleanup levels, but below documented background concentrations, and appears to be the result of naturally occurring mineral deposits in the area (USACE 2019). In the active portion of the landfill arsenic concentrations are very low or are not detected and are below the Landfill Groundwater Protection Standard. Mercury concentrations were not detected in groundwater samples (USAG Alaska 2020a).

Underground Storage Tanks and Aboveground Storage Tanks

There are 58 ASTs on the Main Cantonment Area, ranging in size from a 560-gallon AST used to contain diesel fuel to 40,000-gallon ASTs used to store JP-8. The majority of ASTs have associated secondary containment/diversion structures (DLA Energy 2018).

Also on the Main Cantonment Area, there are 36 USTs ranging in size from 500-gallon USTs used to store heating oil, diesel, and unleaded regular motor fuel to 30,000-gallon USTs used to store heating oil, JP-8, and unleaded regular motor fuel. There are no permanently closed USTs on Fort Wainwright (DLA Energy 2018).

Currently five LUST sites and 60 non-LUST contaminated sites are listed for Fort Wainwright in the ADEC contaminated sites database with an open designation, denoting that some form of remediation or environmental monitoring is currently in progress. These sites include a wide range of contaminant sources affecting soil and groundwater on the Main Post. In addition to the open sites, six LUST sites and 12 non-LUST contaminated sites are listed as cleanup complete with institutional controls, indicating that the site may require further cleanup efforts if specific criteria are met, and 37 LUST sites and 44 non-LUST contaminated sites that have been given a cleanup complete designation, indicating that remediation has been completed to satisfactory levels and no further remedial activities are warranted (ADEC 2019d).

Asbestos

EPA issued a ban on asbestos in 1989 with a phase out-rule in 1991. Because of the construction date of many structures on Fort Wainwright, however, it is possible for ACM to be present on interior and exterior surfaces. Demolition or renovation of buildings with ACM has a potential for releasing asbestos fibers into the air. The current practice is to manage or abate ACM in active facilities and abate any ACM that has been identified as a hazard to human health, following regulatory requirements and before facility demolition or renovation. Removal of ACM occurs when there is a potential for asbestos fiber release that would affect human health or the environment (USAG Fort Wainwright 2017a).

According to the installation’s Asbestos Management Plan, any ACM is handled in accordance with applicable EPA and OSHA regulations by a licensed contractor. In accordance with the requirements, USAG Alaska provides a written “Notification of Demolition and Renovation” to the EPA Region 10 Asbestos Coordinator 10 working days before beginning any work on an asbestos project (USAG Fort Wainwright 2007a).

Radon

According to the EPA Radon Zone Map, Fort Wainwright is in Radon Zone 2, which is a moderate zone with a range of 2 to 4 pCi/L in indoor air. EPA has a radon guidance level of 4 pCi/L in indoor air for residences; however, no standards have been established for nonresidential structures (EPA 2019b).

Lead-Based Paint

DoD implemented a ban of LBP use in 1978. Because of the construction date of some structures on Fort Wainwright (prior to 1978), it is possible for LBP to be present on interior and exterior surfaces. Typically, the Army does not actively pursue removal of LBP. Instead, it is managed in place and removed as necessary (USAG Fort Wainwright 2017a).

Polychlorinated Biphenyls

Structures constructed before 1979 potentially include PCB-containing building materials in the electrical systems. PCBs are not known to be present in transformers at Fort Wainwright. PCBs may be present in ballast units of older fluorescent light fixtures. Although not defined as PCB equipment or PCB-contaminated equipment, these ballasts could leak or spill and result in a release of PCBs (USAG Fort Wainwright 2017a).

Unexploded Ordnances

UXOs may be encountered throughout the installation. Upon identification, UXOs must be reported immediately to Range Control (Alaska Ranges Range Control undated, Buzby 2019).

Several active MMRP sites that require further action exist at Fort Wainwright in the Main Cantonment Area: FTWW-004-R-01, Arctic Survival Area-Ski Slope; FTWW-001-R-01, TA-105; and FTWW-002-R-01, TA-101. The primary contaminants of concern at these sites include munitions and explosives of concern and munitions constituents in the groundwater and soil on the installation. The response is complete or require no further action for other MMRP sites within the Main Cantonment Area (TLI Solutions 2009, USAG Fort Wainwright 2016).

Petroleum, Oil, and Lubricants

The primary activities associated with POL at Fort Wainwright include the receipt, storage, and transfer of oil for rotary-wing and fixed-wing aircraft fueling, maintenance activities, ground vehicle fueling, and heating. POL is stored within USTs, ASTs, oil-water separators, oil-filled operational equipment, mobile/portable tanks, oil drum storage, and animal fat and vegetable oil containers (DLA Energy 2018).

Hazardous Substances Regulated by the Emergency Planning and Community Right-to-Know Act

Fort Wainwright is a Toxic Release Inventory (TRI) reporting facility. A TRI, the reporting mechanism for long-term releases from industrial activities, is prepared by the Army each year. For the most recent TRI report available for the Main Cantonment

Area (2017), Fort Wainwright reports on aluminum (flume or dust), barium compounds, chromium compounds (except chromite ore mined in the Transvaal region), copper, dioxin and dioxin-like compounds, hydrochloric acid (1995 and after "acid aerosols" only), hydrogen fluoride, lead, lead compounds, manganese compounds, mercury, mercury compounds, nitroglycerin, sulfuric acid (1994 and after "acid aerosols" only), and vanadium compounds (EPA 2019c).

3.4.2 Environmental Consequences

3.4.2.1 Significance Criteria

A significant impact on or from hazardous materials and wastes would result if the Army action were to result in any of the following:

- Substantially increase the amounts of hazardous materials or wastes used, generated, or procured beyond current management procedures, permits, and capacities
- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation
- Create substantial restrictions on the use of property currently not managed under the Cleanup Program due to hazardous waste, materials, or site remediation
- Disturb or create contaminated sites resulting in substantial negative impacts on human health or the environment
- Make it substantially more difficult or costly to remediate existing contaminated sites

3.4.2.2 No Action Alternative

Short-term, minor, adverse impacts could occur as a result of the No Action Alternative. Hazardous waste would temporarily increase from repair- and upgrade-related activities. Any hazardous waste generated would be handled according to the protocol outlined in the Fort Wainwright *Hazardous Material and Waste Management Plan* (USARAK and USAG Fort Wainwright 2013).

ACMs could be released from older building materials that may be removed or altered during necessary improvements to the CHPP and associated structures. LBP could be present in materials that would be removed or demolished during improvement activities. PCBs could be disturbed during demolition-related activities.

Long-term, negligible, beneficial impacts could occur as a result of the removal and the proper disposal of any ACMs, LBP, and PCBs encountered during renovation of the CHPP. Ongoing operations of the existing CHPP would continue to use coal. Coal ash is spontaneously combustible, and the risk of coal dust fires or explosions would continue. Risk would continue to be minimized through BMPs such as ensuring a well-maintained coal ash collection system. Under the No Action Alternative, coal ash would continue to be disposed of at the Class 1 landfill at Fort Wainwright or coal ash could potentially be disposed of in the lined landfill operated by FNSB, if FNSB agreed to accept it.

3.4.2.3 Alternative 1 (Build a New Coal CHPP)

Short-term, minor, adverse impacts could occur as a result of Alternative 1. Hazardous and solid waste generation would temporarily increase due to construction and demolition activities. Any hazardous waste generated would be handled according to the protocol outlined in Fort Wainwright *Hazardous Material and Waste Management Plan* (USARAK and USAG Fort Wainwright 2013). Adherence to that plan and the USAG Fort Wainwright SPCC Plan (DLA Energy 2018) would minimize potential impacts resulting from hazardous materials and wastes production or management during construction and demolition activities associated with Alternative 1. Further groundwater and soil contamination would be avoided through implementation of the *Hazardous Material and Waste Management Plan*, the SPCC Plan, and applicable regulations.

ACMs could be released from older building materials that may be removed or altered during CHPP demolition. During demolition, buildings would be sprayed with water to avoid or minimize airborne ACM. ACMs would be disposed of or managed through abatement in accordance with applicable regulations and the USAG Fort Wainwright Asbestos Management Plan, minimizing potential impacts. LBP could be present in materials that would be removed or demolished during demolition. Management of LBP in accordance with applicable regulations and the USAG Fort Wainwright LBP Management Plan would reduce potential impacts.

PCBs could be disturbed during demolition-related activities. PCBs may be present in light ballasts, which would be disposed of in accordance with state and federal regulations. Construction-related activities could also disturb previously unknown PCB-contaminated soils, if any, in the vicinity of the existing CHPP. USAG Alaska would implement sampling analysis and work plans as required before any ground disturbance to identify and address any current or historical contamination.

Enough coal would continue to be stored on the site in an amount sufficient to supply power for a minimum of a 14 days. A coal ash waste stream exists for the existing CHPP. Because Alternative 1 would build a new coal CHPP near the existing plant, a similar waste stream would continue to be used, although less coal and, therefore, less coal ash would be generated from a more efficient CHPP. Due to the use of modern industrial standards and up-to-date fire and life safety requirements, the risk of fires or explosions from coal ash at the new plant would be less than current conditions. Risk would continue to be minimized through BMPs such as ensuring a well-maintained coal ash collection system. At the landfill, procedures would continue to be followed to ensure coal ash would not become airborne. Although the possibility for arsenic and mercury contamination could occur from unlined coal ash deposits, the Army would continue to monitor groundwater quality and collect samples annually from groundwater wells to minimize the potential for human health impacts (see Section 3.10.2.3). See Section 3.3.2.3 for additional discussion on coal ash management.

Soil disturbance could increase radon levels at the site, but levels would be unlikely to surpass the EPA's 4 pCi/L threshold.

Because construction of the new Coal CHPP would be in the same general location as the previous plant, UXO is not expected to be encountered. The existing and proposed CHPP locations do not coincide with any MMRP sites.

Construction of the new CHPP has the potential to disturb remedial actions at known contamination sites in the vicinity of the existing CHPP, and may result in the identification of previously unknown contaminated sites that would require appropriate remediation. To minimize adverse impacts, USAG Alaska would appropriately implement work plans, sampling analysis, characterization, and any necessary remediation following protocols before any demolition or ground disturbance to identify and address any current or historical contamination. Remedial actions would continue according to CERCLA regulations for these active sites.

Long-term, negligible, beneficial impacts could occur as a result of the removal and the proper disposal of any ACMs, LBP, and PCBs during demolition of the existing CHPP.

3.4.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Impacts on hazardous materials and wastes would be similar to those described for Alternative 1; however, a new waste stream would be created from the products of the combustion of natural gas and ULSD, if applicable, resulting in long-term, negligible, adverse impacts. Generation of hazardous waste would be managed and groundwater and soil contamination would be avoided or minimized through implementation of the installation's *Hazardous Material and Waste Management Plan* (USARAK and USAG Fort Wainwright 2013), the SPCC Plan, and applicable regulations. The waste stream would not be handled as hazardous waste in accordance with EPA's ruling that Fossil Fuel Combustion Wastes are excluded from hazardous waste regulations under Subtitle C of RCRA (EPA 2019d). With the elimination of coal use at the CHPP, the coal stockpile near the CHPP would be closed and treated in accordance with CERCLA and ADEC regulations, resulting in moderate, beneficial impacts.

Shipment of natural gas to the installation would occur via freight train or truck, or via a pipeline from Fairbanks. Potential short-term impacts could occur from the unlikely risk of leakage during transportation, which would be addressed accordingly in compliance with remediation regulations. Long-term, negligible, adverse impacts could be expected as a result of potential construction of a natural gas pipeline from a proposed off-post location to the installation (Interior Gas Utility [IGU] 2019). Any risk of long-term groundwater contamination from pipeline leaks would be minimized through implementation of design specifications and BMPs. Known contaminated sites would be avoided, to the extent possible, during transportation of natural gas or construction of a natural gas pipeline to the installation. If known contaminated sites cannot be avoided along the potential natural gas pipeline route, remediation efforts would be conducted in accordance with the applicable CERCLA, ADEC, and RCRA regulations to minimize further contamination.

An increase in POL on the installation would occur as a result of the storage and use of ULSD as a secondary fuel source for the new CHPP. Additional USTs and ASTs would be added to maintain ULSD storage for a minimum of 14 days.

3.4.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Impacts on hazardous materials and waste would be similar to those described for Alternative 2; however, the only new waste streams would be created from the products of the combustion of natural gas. Generation of hazardous waste would be managed and groundwater and soil contamination would be avoided through implementation of the installation's *Hazardous Material and Waste Management Plan* (USARAK and USAG Fort Wainwright 2013), the SPCC Plan, and applicable regulations.

During construction of the distributed natural gas boilers at major facilities across the Main Cantonment Area, UXO could be of concern; however, any impacts would be minimized through implementation of typical UXO handling procedures. As the new distributed natural gas boilers are located, known MMRP and IRP contaminated sites could be affected. If possible, construction activities should be avoided at contaminated sites because ground disturbance in contaminated areas could further release pollutants and disrupt remedial processes. USAG Alaska would implement sampling and analysis work plans as appropriate to identify and remediate any current or historical contamination at potential boiler installation sites. To maintain compliance, the USAG Fort Wainwright Remedial Project Manager would be consulted to follow the protocol designated by the institutional and land use controls in place at the installation before ground disturbance.

3.5 Socioeconomics

3.5.1 Affected Environment

The ROI for the assessment of potential impacts covers the areas where the direct and secondary effects of the activities associated with the proposed project alternatives would likely occur and where most consequences for local and regional jurisdictions would be expected.

For socioeconomics, those areas are where the following would occur:

- Construction or the facility upgrades
- Locations of the fuel, transportation, and other potentially affected service providers and service operators.
- Possible effects on residents from changes in utility rate costs

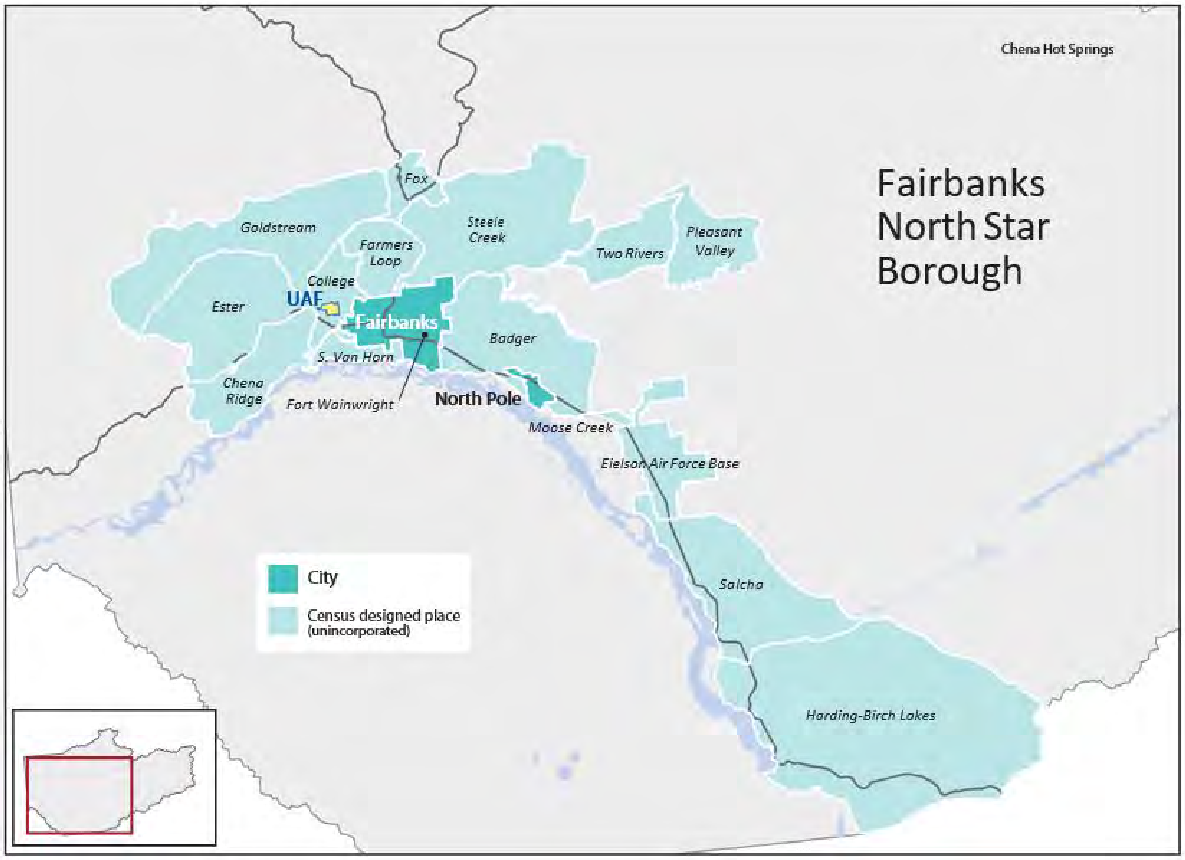
3.5.1.1 Definition of Resource

Socioeconomics pertains to the social and economic conditions of the human environment. For this analysis, the indicators of socioeconomic conditions include population, employment, unemployment rate, income, cost of living, and housing availability. Current data on these indicators for the affected environment would provide the baseline information on the socioeconomic well-being of the local areas/region upon which potential effects of the proposed project alternatives are compared.

The proposed heat and electrical generation and distribution facility upgrades would occur within Fort Wainwright, located in the FNSB. The borough is the cultural and commercial center of the Interior Region as well as a hub for villages located hundreds of miles outside the region (Alaska Department of Labor and Workforce Development [ADOLWD] 2018).

Figure 3.5-1 shows the different communities within the borough, including the City of Fairbanks and Fort Wainwright.

The City of Fairbanks, on the western boundary of Fort Wainwright, is the largest city in the borough, and it is where the natural gas provider and the electric utility that services the region are located. The City of Fairbanks is the economic, medical, educational, and cultural center of Interior Alaska.



Source: ADOLWD 2018

Figure 3.5-1. FNSB Region

Other areas outside the FNSB region that are anticipated to be affected by the proposed project alternatives include Healy (a census-designated place [CDP] in the Denali Borough) where a local coal provider that supplies coal to Fort Wainwright is located, Point MacKenzie (a CDP in the Matanuska-Susitna Borough) where the only currently operating LNG facility in Alaska is located, and Nikiski and Valdez, which have ULSD production refineries. The delivery mode and route for transporting the alternative fuels for the alternatives would also affect traffic volumes in the communities along the transportation route; these impacts are discussed in Section 3.9, Transportation and Traffic.

3.5.1.2 Environmental Laws, Regulations, and Executive Orders

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

3.5.1.3 Current Condition

Population

With an estimated population of 97,121, FNSB is the third most populated region in Alaska, based on the 2018 population estimates of the different boroughs and census areas in the state. The Municipality of Anchorage is the most populated region with 295,365 residents, followed by the Matanuska-Susitna Borough with 105,743 residents (ADOLWD 2019a).

Table 3.5-1 shows the population in the potentially affected areas from 2010 to 2018. The FNSB population has declined slightly since 2010 (a decline of 460), but in the intermediate years, year-over-year change in population has been up and down with an increase of as many as 2,398 people from 2011 to 2012 and a decline of as many as 1,280 residents from 2013 to 2014. The City of Fairbanks on the other hand, has experienced a slight overall increase in population from 2010 to 2018 (an increase of 133 residents) with similar increases and decreases in the intervening years.

The majority of the borough residents live in unincorporated areas (also called CDPs). Only the cities of Fairbanks and North Pole are incorporated.

Table 3.5-2 shows the military population at Fort Wainwright. In FY 2018, the total military population at Fort Wainwright ranged from 13,579 to 14,151.

Healy, Alaska, an unincorporated CDP located about 80 miles southwest of Fairbanks and FNSB, is the most populated community within the Denali Borough. Besides Healy, there are only four other CDPs in the borough. In 2018, 58 percent of the borough's population lived in Healy, which is located on a 2.5-mile spur road off the George Parks Highway, just north of the entrance to the Denali National Park and Preserve (Alaska Department of Commerce, Community, and Economic Development [ADCCED] 2019).

Point MacKenzie, Alaska, is an unincorporated CDP located between the south shore of Knik Arm of Cook Inlet and the Little Susitna River in the Matanuska-Susitna Borough. It lies on Point MacKenzie Road, south of Big Lake, about 15 miles southwest of Wasilla. In 2018, the community had a population of 1,965. There is a deep draft port in the area. The existing LNG facility that provides natural gas to the Fairbanks region is located in Point MacKenzie. Point MacKenzie is about 335 road miles south of Fairbanks.

Nikiski, Alaska, is located on the Kenai Peninsula, 9 miles north of the City of Kenai, off the Sterling Highway (ADCCED 2019). Nikiski has grown from when it was homesteaded in 1940 to a community with about 4,563 residents in 2018. The community has grown with discovery of oil on the Kenai Peninsula in 1957. The state's largest oil refinery is located in Nikiski. Nikiski is about 530 road miles south of Fairbanks.

Table 3.5-1. Population Estimates in the ROI, 2010 to 2018

Borough/City/CDP	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fairbanks North Star Borough	97,581	98,247	100,645	100,038	98,758	98,730	98,999	97,855	97,121
Badger CDP	19,482	19,888	19,951	19,491	19,172	19,125	19,336	19,016	18,910
Chena Ridge CDP	5,791	6,051	6,151	6,232	6,178	6,206	6,367	6,278	6,272
College CDP	12,964	13,353	13,412	13,246	13,145	13,017	12,835	12,386	12,157
Eielson AFB CDP	2,647	2,682	3,144	2,944	2,604	2,867	2,918	2,958	2,706
Ester CDP	2,422	2,530	2,625	2,602	2,553	2,526	2,498	2,464	2,431
Fairbanks City	31,535	30,622	31,996	32,230	31,870	32,120	31,961	31,902	31,668
Farmers Loop CDP	4,853	4,963	5,001	4,969	4,978	4,847	4,828	4,794	4,865
Fox CDP	417	458	439	460	430	425	435	434	410
Goldstream CDP	3,557	3,644	3,718	3,667	3,713	3,709	3,667	3,655	3,625
Harding-Birch Lakes CDP	299	299	299	354	328	313	317	327	338
Moose Creek CDP	747	735	729	669	633	619	651	639	666
North Pole City	2,117	2,099	2,158	2,214	2,207	2,144	2,147	2,125	2,101
Pleasant Valley CDP	725	741	743	717	746	697	703	685	713
Salcha CDP	1,095	1,094	1,112	1,053	1,061	1,053	1,028	1,020	1,019
South Van Horn CDP	558	576	564	569	564	516	568	553	555
Steele Creek CDP	6,662	6,749	6,819	6,829	6,870	6,800	7,007	6,891	6,886
Two Rivers CDP	719	726	722	706	663	693	692	653	663
Denali Borough	1,826	1,835	1,846	1,780	1,777	1,775	1,871	1,834	1,825
Healy CDP	1,021	1,047	1,078	1,071	1,106	1,087	1,067	1,074	1,057
Kenai Peninsula Borough	55,400	56,490	56,599	56,875	57,395	57,672	58,038	58,110	58,471
Nikiski CDP	4,493	4,636	4,623	4,607	4,703	4,564	4,621	4,615	4,563
Matanuska-Susitna Borough	88,995	91,652	93,601	95,864	98,143	99,961	102,624	104,388	105,743
Point MacKenzie CDP	529	609	557	1,526	2,025	1,922	1,760	1,991	1,965
Valdez-Cordova Census Area	9,639	9,828	9,936	9,809	9,594	9,525	9,497	9,397	9,451
Valdez City	3,976	4,032	4,131	4,094	4,042	4,009	3,939	3,942	3,903

Source: ADOLWD 2019a

Table 3.5-2. FY 2018 Quarterly Military Population, Fort Wainwright

FY months	Military Active Duty Personnel	Military Dependents	Total
Oct.–Dec.	7,160	6,986	14,146
Jan.–March	7,212	6,939	14,151
April–June	7,199	6,893	14,092
July–Sept.	7,052	6,527	13,579

Source: FNSB 2018a

The City of Valdez is in the Valdez-Cordova Census Area. Valdez is located on the north shore of Port Valdez, 305 road miles east of Anchorage and 364 road miles south of Fairbanks. It is the southern terminus of the trans-Alaska oil pipeline and the only other refinery in the state besides Nikiski that can supply heating fuel (ULSD) for domestic consumption. The city's population in 2018 was about 3,900.

Employment

Table 3.5-3 shows the number and percent of workers by sector for each of the areas in the ROI. The values in the table represent jobs by place of residence (as opposed to place of work) or the number of jobs by sector that are held by residents of the region/community, regardless of where the jobs are located. The estimates are for the year 2016, the most recent data available for employment by place of residence.

At the regional level, the local and state government sector (8,039) and the trade, transportation, and utilities sector (7,976) employ the highest numbers of FNSB residents. The military is also an important employer and economic driver in the region. Both Fort Wainwright and Eielson Air Force Base (AFB) also support many civilian jobs. In 2017, it was estimated that 8,487 active-duty personnel were employed in the region, which is not reflected in the table (ADOLWD 2018).

More recent estimates of employment by place of work include workers from outside the FNSB. In 2018, 37,957 wage and salary jobs were reported in the region, of which 10,489 were in civilian federal, state, and local governments (including tribal governments and public schools) (ADOLWD 2018).

At the local level, the largest share of private-sector jobs in the City of Fairbanks was in the trade, transportation, and utilities sector, followed by the education and health services and the leisure and hospitality sectors. The government sector employed 16 percent of the workers who reside in Fairbanks.

Table 3.5-3. Employment by Sector by Place of Residence in the Potentially Affected Areas, 2016

Industry or Sector	FNSB		Fairbanks		Healy		Point MacKenzie		Nikiski		City of Valdez	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Natural Resources and Mining	1,794	5	398	4	111	14	6	7	97	20	281	15
Construction	2,779	8	591	6	74	10	13	15	42	9	138	8
Manufacturing	703	2	147	2	1	0	1	1			106	6
Trade, Transportation, and Utilities	7,976	22	2,410	24	121	16	19	11	78	16	358	20
Information	504	1	183	2	7	1	1	1	4	1	17	1
Financial Activities	1,283	4	424	4	11	1	1	1	9	2	57	3
Professional and Business Services	2,920	8	837	8	55	7	2	2	22	5	112	6
Educational and Health Services	5,187	14	1,616	16	37	5	15	17	23	5	234	13
Leisure and Hospitality	4,135	11	1,516	15	189	24	6	7	119	25	150	8
State Government	4,629	13	834	8	39	5	8	9	14	3	65	4
Local Government	3,410	9	758	8	123	16	10	11	67	14	239	13
Other	961	3	279	3	7	1	5	6	7	2	82	5

Source: ADOLWD 2019b

Healy is originally a coal-mining town that has also evolved into a more economically diverse community. The only operating coal mine in the state is located in Healy. Tourism also benefits the local economy during summer months. In 2016, 24 percent of the resident workers were employed in the leisure and hospitality sector, the highest share among the various sectors, followed by government (21 percent); trade, transportation, and utilities sector (16 percent); and the natural resources and mining sector (14 percent).

Unemployment Rate

Data on unemployment rates are only available at the regional level. In 2018, the FNSB unemployment rate was 5.8 percent, which was lower than the statewide average of 6.6 percent, and lower than the unemployment rates in other regions with comparable population and economic conditions (i.e., Matanuska-Susitna Borough and Kenai Peninsula Borough), but higher compared to the Municipality of Anchorage (see Table 3.5-4).

Table 3.5-4. Comparison of Unemployment Rates, Selected Alaska Regions, 2018

Region	Annual Average Unemployment Rate (%)
Alaska	6.6
Fairbanks North Star Borough	5.8
Denali Borough	7.8
Valdez-Cordova Census Area	7.8
Kenai Peninsula Borough	7.7
Matanuska-Susitna Borough	7.6
Municipality of Anchorage	5.5

Source: ADOLWD 2019c

The Denali Borough's unemployment rate was 7.8 percent, which was comparable to the unemployment rates in the Valdez-Cordova census area and the Kenai Peninsula Borough.

Income

The most recent available data on wages (by place of residence) at the local level is for year 2016. Table 3.5-5 shows total wages earned by residents of the areas in the ROI. The total amount of wages earned by FNSB residents in 2016 was the highest among the regions in the ROI. Wages of residents of the City of Fairbanks only accounted for 3 percent of the total wages in the region. In contrast, Healy residents' total wages accounted for 65 percent of the total regional wages earned in 2016.

Table 3.5-5. Total Wages Earned by Residents in the Affected Environment, 2016

Region or Local Area	Amount ($)	Percent of Region
Fairbanks North Star Borough	13,094,184,783	
City Fairbanks	372,585,302	3
Denali Borough	35,101,203	
Healy	22,938,924	65
Matanuska-Susitna Borough	1,767,833,106	
Point MacKenzie	4,140,996	<1
Kenai Peninsula Borough	992,785,526	
Nikiski	82,695,168	8
Valdez-Cordova Census Area	184,403,147	
City of Valdez	103,964,348	56

Source: ADOLWD 2019b

More recent data (year 2018) on annual average monthly wages by industry and by place of work are available at the regional or borough level; Table 3.5-6 shows data for the FNSB and the Denali Borough.

Table 3.5-6. Annual Average Monthly Wage ($) by Sector in Fairbanks North Star Borough (FNSB) and Denali Borough, 2018

Industry or Sector	FNSB	Denali Borough
Natural Resources and Mining	7,172	--
Construction	7,246	4,448
Trade, Transportation, and Utilities	3,583	3,960
Information	4,731	--
Financial Activities	4,338	--
Professional and Business Services	4,674	--
Educational and Health Services	4,434	2,265
Leisure & Hospitality	1,794	2,655
Other Services	2,881	--
Government	4,949	4,836

Source: ADOLWD 2020

In the FNSB, the construction industry paid the highest average wage in 2018, followed by the natural resources and mining sector. It is also worth noting in this study that the average monthly wage in the FNSB in the utilities sector, which is not shown in the table but is included in the trade, transportation, and utilities sector, was among the highest in the region ($8,137). In the Denali Borough, highest wages were recorded in the government and construction sectors; however, because of data confidentiality rules by ADOLWD, wages in other sectors such as mining were not reported. Statewide, mining wages were the highest in the state, with an annual average monthly wage of $11,570, or $138,840 annually, in 2018 (ADOLWD 2020).

Mining jobs are important to the local economy at Healy, a community of about 1,080 permanent residents. The jobs at the coal mine are among the highest paying jobs in the community. Total wages paid by the coal mine in 2016 amounted to $12.1 million; 109 workers were employed by the mine that year; and the average annual wage paid was more than double the 2016 statewide average for all workers ($53,000), the FNSB ($50,500), and the Denali Borough ($44,500) (McDowell Group 2018). Most other wages in the Denali Borough are in relatively lower-paying, seasonal, service-sector jobs, primarily in leisure and hospitality. As shown in Table 3.5-3, jobs in the natural resources and mining sector, accounted for 14 percent of the total jobs held by residents of Healy.

Housing

FNSB is expected to be the most likely affected area with respect to housing because construction and operation under the Proposed Action would occur in this region. Housing in other areas in the ROI are not expected to be affected. End-of-quarter housing availability indicators for 2018 in the FNSB region are shown in Table 3.5-7.

Table 3.5-7. Housing Indicators in FNSB, 2018

Month	Apartment/Multi-Plex Vacancy Rates (%)	Total Rental Housing Units Available
March	13	492
June	12	482
September	13	487
December	18	634

Source: FNSB 2018a

Cost of Living

Local housing and land costs are relatively low in Fairbanks compared to those in Anchorage and Juneau, but utilities are generally more expensive. Because households spend about 10 percent of their income on utilities, that disparity drives up considerably the overall cost of living in Fairbanks, according to a Council for Community and Economic Research study of urban areas that includes Anchorage, Fairbanks, Juneau, and Kodiak. Given an index value of 100 as the average for U.S. cities included in the study, the cost of living in Fairbanks is 132.6 in 2017, nearly on par with Juneau (133.2) and above the cost in Anchorage (128.2) (ADOLWD 2018).

The 2017 Fairbanks utilities index was more than double that of the national average, at 217.9, while the Anchorage utility index was at 103.6. The Fairbanks area relies heavily on oil and has limited natural gas-based heating systems, and Anchorage has access to more affordable natural gas for heat. The Fairbanks region's cold climate also results in higher heating costs (ADOLWD 2018).

The State of Alaska's Interior Energy Project (IEP), which is being advanced by the Alaska Industrial Development and Export Authority (AIDEA), was envisioned to find a solution to high energy costs and poor air quality in the region. The IEP provides the financial tools needed to specifically bring natural gas to Interior Alaskans. The legislation passed in 2013 authorizes AIDEA to provide the financing package to partner with the private sector to bring affordable, clean-burning natural gas to Interior Alaska (AIDEA 2019).

Economic Sectors

This subsection briefly describes the economic sectors and businesses that would likely be affected by the proposed project alternatives. These sectors and businesses include the utility at Fort Wainwright, the electric utility in Fairbanks, the natural gas utility in Fairbanks, the coal mine in Healy, and the Alaska Railroad Corporation (ARRC).

Fort Wainwright UPC System Owner, FNSB. The most directly affected business would be the System Owner, which owns, operates and maintains the CHPP itself and the utilidors. The System Owner is 50 percent owned by a for-profit regional ANC that was established under ANCSA, which provided capital to regional and village corporations for investment in diverse industries and services in order to produce investment revenue for Alaska Native shareholders, the ultimate beneficiaries of ANCSA. Any action taken that affects the income of the ANC, directly affects the segment of the Alaska Native population that is also a shareholder of the specific ANC.

The System Owner holds a 50-year UPC for Fort Wainwright, which was granted in 2008. In addition to the CHPP, the System Owner also operates and maintains the heat distribution system and utilidors, electrical distribution system, water distribution system and treatment, and wastewater collection system. The UPC at Fort Wainwright is a regulated tariff-based contract under which the System Owner makes an agreed upon rate of return (referred to as "interest"' in common language) by investing money in the utility infrastructure. The O&M cost is a pass-through cost; whatever it costs to maintain the system, the government reimburses the System Owner with no additional profit or markup on O&M. There are 45 O&M employees at the CHPP; the average annual fully burdened cost per staff to the Army is $149,000 (Black and Veatch 2018). Utility costs associated with heating and supplying electricity across the installation are approximately $58 million per year and are expected to increase significantly over the next 40 years due to the age of the CHPP (USACE 2018).

Local Electric Utility in Fairbanks, FNSB. The local electric utility in the region provides power to about 100,000 Interior residents in Fairbanks, Delta Junction, Nenana, Healy, and Cantwell, including Interior residents who live along the 48-mile Steese Highway, 11-mile Elliot Highway, and 26-mile Chena Hot Springs Road. The utility employed 267 full-time workers in 2018 (Golden Valley Electric Association [GVEA] 2019). The utility operates and maintains 3,261 miles of transmission and distribution lines, 35 substations, and 9 generating facilities. The system is interconnected with Fort Wainwright, Eielson AFB, Fort Greely, the University of Alaska Fairbanks, and all electric utilities in the Alaska Railbelt, which extends from Homer to Fairbanks.

Two interties provide 70 MW of additional capacity from the Anchorage area, augmenting its 296-MW generation capacity: the 97-mile, 230-kilovolt transmission line between Healy and Fairbanks, and the Alaska Intertie, which serves most Railbelt communities. The Alaska Intertie line extends between Willow and Healy along the Parks Highway corridor. Through the Alaska Intertie, the electric utility is connected to other electricity utility providers in the Railbelt.

The utility has nine generating facilities and maintains a diverse fuel/energy source mix of oil, coal, natural gas, hydroelectric power, and wind (GVEA 2019). Total generation capacity of the utility is 381.5 MW. Peak load in 2018 was 196.6 MW. The annual sales of the utility in 2018 amounted to 1.2 billion kilowatt-hours (kWh). The utility has the capacity to support Fort Wainwright's electricity requirements.

Natural Gas Utility in Fairbanks, FNSB. Fairbanks has a public natural gas utility that provides piped natural gas (primarily for heating) to more than 1,000 residential and commercial customers. Currently, the utility has 15 employees in Fairbanks and 9 employees in Point Mackenzie. The utility purchases natural gas from the Cook Inlet area, and the gas is condensed into LNG at the liquefaction facility in Point MacKenzie. Then the LNG is transported to Fairbanks by truck, where it is temporarily stored in tanks before distribution to customers.

The natural gas distribution system in Fairbanks is in the process of expansion, a project that is part of the IEP. The expansion project could accommodate demand from Fort Wainwright, which is in its service area. The utility plans to expand and develop the distribution system to serve approximately 8,800 customers in the FSNB.

The expansion plan also requires expansion of the current LNG facilities, buildout of the distribution system in phases, and investment in additional LNG storage in the service areas, specifically including the following (AIDEA 2019):

- Upgrading the existing liquefaction plant in Point McKenzie (LNG facility)
- Building a new LNG plant, and expanding the capacities to produce approximately 7.5 billion cubic feet (bcf) per year

- Purchasing LNG high-capacity trailers and related equipment to transport LNG from the LNG facility to the FNSB service area
- Adding 5.2 million gallons of LNG storage tanks in Fairbanks and 150,000 gallons of LNG storage tanks in North Pole
- Building out the natural gas distribution systems to deliver approximately 5.5 bcf per year in phases

Coal Mine in Healy, Denali Borough. The coal mine in Healy provides the fuel for the existing CHPP. Located 115 miles south of Fairbanks, the mine is adjacent to the Parks Highway and Alaska Railroad. The mine is the state's only operating coal extraction facility, producing approximately 1.3 million tons of coal annually. Currently, all coal produced by the mine is used in Interior Alaska to generate heat and electricity. Entities with power plants that buy and use coal from this mine include the local electric utility in Fairbanks, University of Alaska Fairbanks, Aurora Energy LLC, Fort Wainwright, and Eielson AFB.

The coal mine currently has a workforce of approximately 115 employees and operates year-round.

Alaska Railroad Corporation. ARRC provides freight service to Fort Wainwright for munitions, household goods, and fuel. Trains make 25 total round trips per week carrying freight to Fort Wainwright, including four round trips to supply coal to the CHPP. The track to the installation also connects with the Fairbanks industrial spur line.

Coal trains operate between Healy and Fairbanks, 111 miles one way (ARRC 2019). Petroleum trains also operate between Fairbanks and Anchorage, 356 miles one-way. ARRC is exploring opportunities to rail LNG to the Fairbanks region using designated containers that could be placed on appropriate flatbed rail cars. It is possible that delivery by rail would be cheaper in the future and reduce additional truck traffic on the highway.

In 2018, ARRC employed 547 year-round and 138 seasonal workers statewide (ARRC 2019).

3.5.2 Environmental Consequences

3.5.2.1 Significance Criteria

An impact on socioeconomics would be considered significant if the Army action were to result in substantial changes on any of these socioeconomic indicators:

- Population levels
- Employment levels
- Business sale volumes

- Cost of living
- Income levels

3.5.2.2 No Action Alternative

Long-term, minor to moderate, adverse impacts would be expected under the No Action Alternative. The existing CHPP and utilidor system would continue to be used and no new facilities would be constructed. Certain actions would have to be done to keep the plant operational, including repairing/upgrading plant parts and technologies, upgrading approximately 27 miles of utilidor pipeline, implementing BACT, and continuing to operate the CHPP boilers at 20 percent reduced capacity (to bring plant emissions into compliance with air quality regulations and standards). Section 2.5.1 (No Action Alternative description) provides information on costs associated with the implementation of BACT.

The System Owner would continue to invest money in the infrastructure as originally proposed in the UPC, while operational costs would continue to rise as discussed in Section 1.5. This capital investment would allow the System Owner to earn interest on its investment, which is the profit expected when the contract was originally signed in 2007. Continuing to operate the CHPP at a 20 percent reduced capacity could also potentially result in direct employment and income effects at the Fort Wainwright utility, and cause indirect effects on the businesses that supply coal and other goods and services to the utility, including the coal mine in Healy and the ARRC, which transports coal from Healy to the Fort Wainwright facility. Although there would be no substantial demolition or construction activities under the No Action Alternative, the repairs and upgrades noted above would result in temporary changes in employment and income in Fairbanks. Temporary jobs would be created to implement the repairs and upgrades to the CHPP and the utilidor system.

The No Action Alternative would not result in changes to the current population levels, housing conditions, or cost of living in the ROI.

3.5.2.3 Alternative 1 (Build a New Coal CHPP)

Construction Phase

Short-term, minor, beneficial impacts on socioeconomics would be expected during construction. Alternative 1 would involve construction of a new coal-fired CHPP and upgrades to the steam distribution system to replace the existing coal-fired CHPP. The existing CHPP would continue to operate until the new CHPP comes online and demolition of the old facility would occur following the operational transition.

Construction and demolition activities under Alternative 1 would be temporary and short term in nature. It is anticipated that the new facility would be fully operational by the Army's target date of approximately 2026. Spending associated with demolition and construction activities would create a short-term stimulus in the FNSB region, particularly in Fairbanks, where most of the construction and other construction-related service providers are based. The estimated total spending during the construction phase is approximately $687 million (USACE 2018); this estimate includes $647 million for initial construction required to implement Alternative 1 and $40 million for demolition activities.

To quantify the employment and income effects resulting from this spending, an economic input-output model called IMPLAN was used. IMPLAN is a common tool used for estimating direct, indirect, and induced economic effects of a project. The economic effects for this analysis were measured at the regional level (FNSB). The methods and assumptions used to conduct this analysis are further described in Appendix D.

Construction and demolition activities under Alternative 1 are estimated to generate approximately 2,700 direct, indirect, and induced jobs (includes both part-time and full-time jobs) and $183 million in labor income in the FNSB region during the construction phase. The Army would likely utilize the existing UPC to construct a new, modern, coal-fired CHPP. In this scenario, the System Owner would invest substantially more money in the utility system, which would generate interest resulting in a benefit to the System Owner. Therefore, the System Owner's net profit would be higher than originally projected in 2007 (Guernsey 2015, USACE 2018).

Temporary workers would come from the borough labor pool and likely also temporarily relocate from elsewhere in Alaska or other states. This temporary relocation could result in minor changes in population and housing. There are no expected changes to the cost of living in the region. Total business sales associated with construction and demolition activities in the region are projected to amount to $287 million during the construction phase.

Operations Phase

Long-term, moderate, adverse and beneficial impacts on socioeconomics would be expected during operations under Alternative 1. Operation of the new CHPP as a cogeneration plant would continue to generate electricity and heat simultaneously into the future. It is assumed that the new plant would be capable of producing 45 MW of average heat energy annually and would operate as a cogeneration plant, in which the plant operates to follow the electricity load. Coal would continue to be the fuel source and would be stockpiled on the site; coal ash would continue to be disposed of at a landfill at Fort Wainwright or ash could potentially be disposed of in the lined landfill operated by FNSB, if FNSB agreed to accept it. The new plant would be capable of producing all the heating requirements and most of the electricity requirements at the installation. Any additional electricity requirements would be purchased directly from a local utility provider.

Annual spending on non-fuel O&M of the new central plant, distribution system, and building mechanical rooms is estimated to amount to $16.1 million. This annual O&M spending is projected to support 44 jobs (direct, indirect, and induced); generate

$3.9 million in labor income; and generate $20.5 million in direct, indirect, and induced business sales in the Fairbanks region, as determined using the IMPLAN model.

The new and more efficient CHPP is expected to require less maintenance than the older existing facility. The IMPLAN model projects that the estimated level of annual O&M spending of the new CHPP would require 16 direct jobs; the model estimates direct employment based on national average workforce requirements for utilities given the level of annual O&M spending, but it is not specific to a utility like the CHPP. With a CHPP that would run 24 hours a day, 7 days a week, the number of workers required could be higher than the model projected. The existing CHPP currently employs 45 jobs.

Coal would continue to be the primary fuel for the new CHPP; however, the new and more efficient facility would require less coal than the existing facility. It is estimated that the new facility would require 161,147 tons of coal, or a 30 percent reduction from the coal consumption at the existing CHPP (USACE 2018). This decrease in coal consumption would reduce the business sales volume at the coal mine by about 12 percent. The reduced demand could in turn result in job and income losses in Healy, but it is uncertain how many of the 115 jobs at the mine would be affected by the reduction in the business sales volume.

Under Alternative 1, approximately 36 million kWh (36,000 megawatt-hours [MWh]) of electricity would be generated annually at the plant (only enough to satisfy the thermal loads). Additional electricity is expected to be purchased from the local electric utility in Fairbanks above and beyond that generated by the new cogeneration plant to meet Fort Wainwright's demand. It is estimated that approximately 66 million kWh (66,000 MWh) would be purchased from the local utility annually (USACE 2018). This volume represents a 5 percent increase in business volume of the utility. The increase is not expected to result in changes in employment and income in Fairbanks.

Under Alternative 1, no changes in population levels in the ROI are expected. There could be slight changes in the cost of utilities among the residents at Fort Wainwright because the new plant is expected to be more cost efficient and utility fuel costs are expected to be lower.

3.5.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Construction Phase

Short-term, minor, beneficial impacts on socioeconomics would be expected during construction. Alternative 2 would involve demolition of the existing CHPP and construction of a new dual-fuel combustion turbine generator CHPP. Similar to Alternative 1, the existing CHPP would continue to operate until the new CHPP comes online. Demolition of the old facility would occur following the operational transition.

The total estimated spending during the construction phase is $363 million (USACE 2018); this estimate includes $323 million for initial construction required to implement

Alternative 1 and $40 million for demolition activities. Construction activities would generate short-term and temporary employment and income effects at the local (Fairbanks) and regional level (FNSB). It is estimated that construction and demolition activities would generate approximately 1,700 total direct, indirect, and induced jobs and generate $121 million in labor income. Total business sales in the region is expected to amount to $287 million during the construction phase. The Army may utilize the existing UPC to construct a new, modern, dual-fuel combustion turbine generator CHPP, which would result in similar benefits to the System Owner as described in Alternative 1.

Temporary workers would come from the borough labor pool and likely also temporarily relocate from elsewhere in Alaska or other states. The duration of construction and demolition work would not be long enough to result in any permanent changes to the local and regional socioeconomic conditions. No permanent changes to population, availability of housing, and cost-of-living are expected during the construction phase.

Operations Phase

Long-term, minor to locally significant, adverse and beneficial impacts on socioeconomics would be expected during operations under Alternative 2. It is assumed that the new plant would be capable of producing 45 MW of heat energy and would operate as a cogeneration plant, in which the plant operates to follow the electricity load; any additional electricity would be purchased from the local electric utility.

Non-fuel O&M of the new CHPP is estimated to cost $8.4 million annually. O&M activities are projected to support 28 direct, indirect, and induced jobs; generate $2.8 million in labor income; and generate $13.8 million in direct, indirect, and induced business sales in the FNSB region.

The estimated level of annual O&M spending of the new CHPP is projected to require about 10 jobs. As previously noted, this estimate was determined using the IMPLAN model which estimates employment based on national average data on workforce requirements for utilities per million dollars of spending on annual O&M, and it is not specific to a utility like the proposed CHPP. With a CHPP that would run 24 hours a day, 7 days a week, the number of workers required could be higher than the model projected. The existing CHPP currently employs 45 jobs.

As noted in Section 2.5.1, under Alternative 2, USAG Alaska would be required to secure a sustained supply of natural gas or ULSD, and the availability of natural gas in Alaska is sufficient to meet the installation’s demand. It is assumed that natural gas would be supplied by the local gas utility provider via a pipeline to the installation, and ULSD would be sourced from existing refineries in the state, transported, and stored in ASTs located on the installation. The primary fuel for the new plant would be natural gas, and the secondary fuel would be ULSD.

The change in fuel source and delivery under Alternative 2 would increase business sales volume in the natural gas utility sector in the City of Fairbanks (in the FNSB).

The annual building heating load under Alternative 2 would require approximately 2,620,699 thousand cubic feet of natural gas (USACE 2018). This additional volume would require expansion of the pipeline distribution system in Fairbanks. It is assumed that the additional load would be accommodated by the proposed expansion consistent with the IEP.

In addition, long-term, moderate, beneficial impacts would result (increase in business sales) to the natural gas extraction sector in Cook Inlet, the LNG facility in Point MacKenzie, and truck transportation services (from Point MacKenzie to Fairbanks). The additional demand for LNG under Alternative 2 would amount to 32 million gallons of LNG per year. Expansion of the LNG facility and additional trucks and trailers would be required to meet this load. As noted above, expansion of the LNG facility is part of the IEP expansion plan.

In the long run, natural gas could also be transported via rail and could increase business volumes of the ARRC, which eventually may offset the decline in business volume associated with transporting coal from Healy to Fairbanks.

The switch in fuel from coal to natural gas for heating would result in a substantial reduction in coal sales from the coal mine in Healy. Therefore Alternative 2 would decrease the business sales volume of the coal mining sector in Healy, resulting in long-term, significant localized impacts.

The existing CHPP requires approximately 222,000 tons of coal per year. The coal mine in Healy produces 1.3 million tons of coal per year, supplying coal to power plants and facilities in the Alaskan interior. As a result of converting to natural gas under Alternative 2, the coal mine would lose approximately 18 percent of its annual sales. It is expected that this loss in sales would result in reduction in employment and income in Healy and the region (Denali Borough); however, it is uncertain exactly how many jobs would be affected. The coal mine currently has a workforce of approximately 115 year-round employees. About 85 percent of its workforce is based in Healy, and these mining jobs are the highest paying jobs in the region. As noted above, it is difficult to project exactly how many jobs would be affected, but an 18 percent reduction in sales could result in a substantial reduction in workforce requirements at the mine and loss of labor income in the region, resulting in significant localized impacts. Downstream effects of the reduction in the business volume of the coal mine would also occur. In 2016, 422 Alaska businesses provided goods and services to and from the coal mine; these businesses, such as ARRC, would also experience a reduction in business. It was estimated that in 2016, between 15 and 20 ARRC employees were directly or indirectly tied to the movement of coal throughout Alaska (McDowell Group 2018).

Furthermore, there would be induced effects on businesses that provide goods and services to the mine workers and their families. A resulting reduction in labor income in the community would result in a reduction in business sales in stores, restaurants, recreational facilities, and personal services sectors.

In addition, under Alternative 2, demand would increase for ULSD, the backup fuel for the heating systems and emergency backup electricity generators at the installation.

A 14-day supply of backup ULSD fuel amounting to about 732,000 gallons would be required under Alternative 2. The 14-day supply of ULSD for this alternative was determined by using the total annual fuel requirements (2,620,699 MMBtu) noted in the USACE 2018 study and the heat content of ULSD (137,380 Btu per gallon). This increase in demand would have beneficial impacts on the refinery sector in the Kenai Peninsula Borough (Nikiski refinery) and in Valdez. Delivery of ULSD from these refineries would affect the truck transportation sector and/or ARRC. Truck and rail transportation sectors have adequate capacity to meet the ULSD requirements. The beneficial impacts on the business volumes, employment, and income of these sectors are expected to be minor and would not result in permanent changes in population, housing, and cost of living in the areas where the refineries are located.

Under Alternative 2, no substantial changes in population are expected in the ROI. However, changes in cost of living in the ROI associated with the cost of utilities could result. It is anticipated that the additional demand for natural gas would benefit the Fairbanks region by creating economies of scale in the proposed expansion of the natural gas distribution system in Fairbanks, thereby lowering the cost of natural gas and heating in the region. At least in the near-term, however, fuel costs at Fort Wainwright would increase because coal costs less than natural gas and ULSD, but the increased fuel costs would be offset by reduced capital costs under this alternative. A power plant that uses fuel other than coal would likely substantially increase fuel costs for the installation's Residential Communities Initiative housing privatization program (USACE 2018).

3.5.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Construction Phase

Short-term, minor, beneficial impacts on socioeconomics would be expected during construction under Alternative 3. The existing CHPP would be demolished and replaced with a decentralized system. Multiple high-efficiency natural gas-fired boilers would be installed at facilities across the installation to provide heat.

Construction and demolition activities for Alternative 3 are estimated to cost $117 million, including $61.5 million for installation of new facilities and demolition of the existing heat exchangers, $40 million for the demolition of the existing CHPP, and $13.2 million for 6 MW in standby generators for mission-critical facilities; there would be additional costs for 20 MW of backup to support other facilities (USACE 2018).

The construction and demotion activities would result in short-term, minor, beneficial impacts on employment, income, and sales in the construction and other support sectors in the Fairbanks region during the construction period. The projected total direct, indirect, and induced effects in the FNSB during the entire construction and demolition phase include 500 jobs (average part-time and full-time), $42.2 million in labor income, and $103 million in total business sales. The installation of individual boilers may be executed under the UPC by the System Owner, through a UESC or by competitive bid. If Alternative 3 is executed, resulting benefits to the System Owner would be similar to those described in Alternatives 1 and 2.

The job estimates are by place of work; these jobs can be held by workers from outside the FNSB region. Temporary relocation of workers could occur during the construction phase, but no permanent or long-term effects on housing, cost of living, and population associated with the construction and demolition activities are projected.

Operations Phase

Long-term, minor to locally significant, adverse and beneficial impacts on socioeconomics would be expected during the operations phase under Alternative 3. Because the existing CHPP would be demolished, the annual O&M expenses for the central plant facilities would be eliminated. Annual non-fuel O&M costs under this alternative were estimated to amount to $1.6 million. Annual costs would include O&M of the boilers, the distribution system (water and wastewater), and the mechanical room (for the boilers). The natural gas distribution system would be owned by the gas utility and O&M costs for the pipeline system would be included in the natural gas rates (USACE 2018).

The projected annual direct, indirect, and induced effects in the FNSB associated with the non-fuel O&M of the new facilities include 10 jobs (average part-time and full-time), $1.1 million in labor income, and $2.4 million in total business sales.

Under Alternative 3, all electricity requirements would be purchased from the local electric utility provider in Fairbanks. The annual electric load, which was calculated as the average of the most recent 3 years of the current utility, would be about 102,000 MWh (USACE 2018). This electric load represents the installation's foundational electric load (excludes the historical station service load and the exported power). The annual electricity requirements for the installation would represent approximately a 9 percent increase in the annual sales of the local electric utility provider. The local electric utility has enough capacity to absorb the additional load; in addition to its own 381-MW generation capacity, an additional 70 MW could be wheeled from electric utilities in the Anchorage area through the Fairbanks-Anchorage Intertie. Given its diverse fuel/energy source mix of oil, coal, natural gas, hydroelectric power, and wind, the local electric utility would most likely satisfy Fort Wainwright's electrical load through the use of the energy source that is least expensive at that time. It is anticipated that, given the current capacity, the employment and income effects on the local electric sector would be marginal.

Similar to Alternative 2, a sustained supply of natural gas to support boiler operations across the installation would be purchased from the local natural gas provider and delivered by pipeline to the installation. In addition, ULSD, which would be used for backup fuel, would be stored in ASTs located on the installation. ULSD-reciprocating internal combustion generators would be used as emergency backup power or heat sources for boilers.

The change in fuel source and delivery under Alternative 3 would result in a change in business sales in the ROI for fuel providers and the coal mining sector. Business sales at the coal mine in Healy (Denali Borough) would decline, and business sales volume in the natural gas utility sector in the City of Fairbanks (FNSB) would increase. Significant localized impacts at the coal mine in Healy would be similar those discussed under Alternative 2.

The annual building heating load under Alternative 3 would require approximately 1,555,389 thousand cubic feet of natural gas (USACE 2018). This additional volume would require expansion of the pipeline distribution system in Fairbanks. It is assumed that the additional load would be accommodated by the proposed expansion consistent with the IEP.

In addition, moderate beneficial impacts (increase in business sales) on the natural gas extraction sector in Cook Inlet, the LNG facility in Point MacKenzie, and truck transportation services (from Point MacKenzie to Fairbanks) would also result. The additional demand for LNG under Alternative 3 would amount to 19 million gallons of LNG per year. Expansion of the LNG facility and additional trucks and trailers would be required to meet this load. As noted above, expansion of the LNG facility is part of the IEP expansion plan.

In the long term, natural gas could also be transported by rail and could increase ARRC business volumes and eventually offset the decline in business volume associated with transporting coal from Healy to Fairbanks.

In addition, demand for ULSD, the backup fuel for the heating systems and emergency backup electricity generators at the installation, would increase.

A 14-day supply of back-up ULSD fuel amounting to about 326,000 gallons would be required under Alternative 3. This increase in demand would have beneficial impacts on the refinery and transportation sectors similar to those discussed for Alternative 2. The beneficial impacts on the business volumes, employment, and income of these sectors are expected to be minor and would not result in permanent changes in population, housing, and cost-of-living in the areas where the refineries are located.

Under Alternative 3, no substantial changes in population are expected in the ROI; however, there could be changes in cost of living in the ROI associated with the fuel cost changes, similar to those discussed under Alternative 2.

3.6 Environmental Justice

3.6.1 Affected Environment

The ROI for the assessment of potential disproportionate impacts on minority and low-income populations and children's environmental health and safety is defined as the geographic areas within the FNSB and Denali Borough described below.

Within the FNSB, the ROI includes the CHPP project site and areas in the immediate vicinity, as well as the potential routes that truck traffic related to project construction would use. The five census tracts that are located within proximity to or encompass this portion of the ROI are shown in Figure 3.6-1. The Fort Wainwright Main Post, together with the Tanana Flats Training Area, are located in FNSB Census Tract 11. The installation's Main Cantonment Area lies within Fairbanks city limits. Census Tract 1 encompasses downtown Fairbanks; Census Tract 3 encompasses south Fairbanks; Census Tract 10 encompasses FAI and South Van Horn; and Census Tract 14 encompasses Badger West (Alaska Department of Transportation and Public Facilities [ADOT&PF] 2019a).

In addition, because FNSB covers a broad area, several small communities surrounding Fort Wainwright are included in the ROI to achieve a more accurate representation of potentially affected minority and low-income populations. Given that human health and safety effects associated with changes in air quality are potential effects of the Proposed Action, communities within the FNSB CO maintenance area and the serious nonattainment area for $PM_{2.5}$ (see Figure 3.2-1). The three communities within these areas are shown in Figure 3.6-1.

Within the Denali Borough, the ROI includes the community of Healy. The potential employment effects of potential changes in production at the coal mine in Healy would be concentrated in this community, where most of the mine employees live.

3.6.1.1 Definition of Resource

The definition of minority as defined by the CEQ guidelines is Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi race that includes one of these races; and Hispanic or Latino. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above stated thresholds (CEQ 1997a). Low income populations are identified in this analysis by using the statistical poverty threshold of the U.S. Census Bureau (USCB), which is based on income and family size.

For the purposes of this environmental justice analysis, children are defined as people 17 years of age and under.

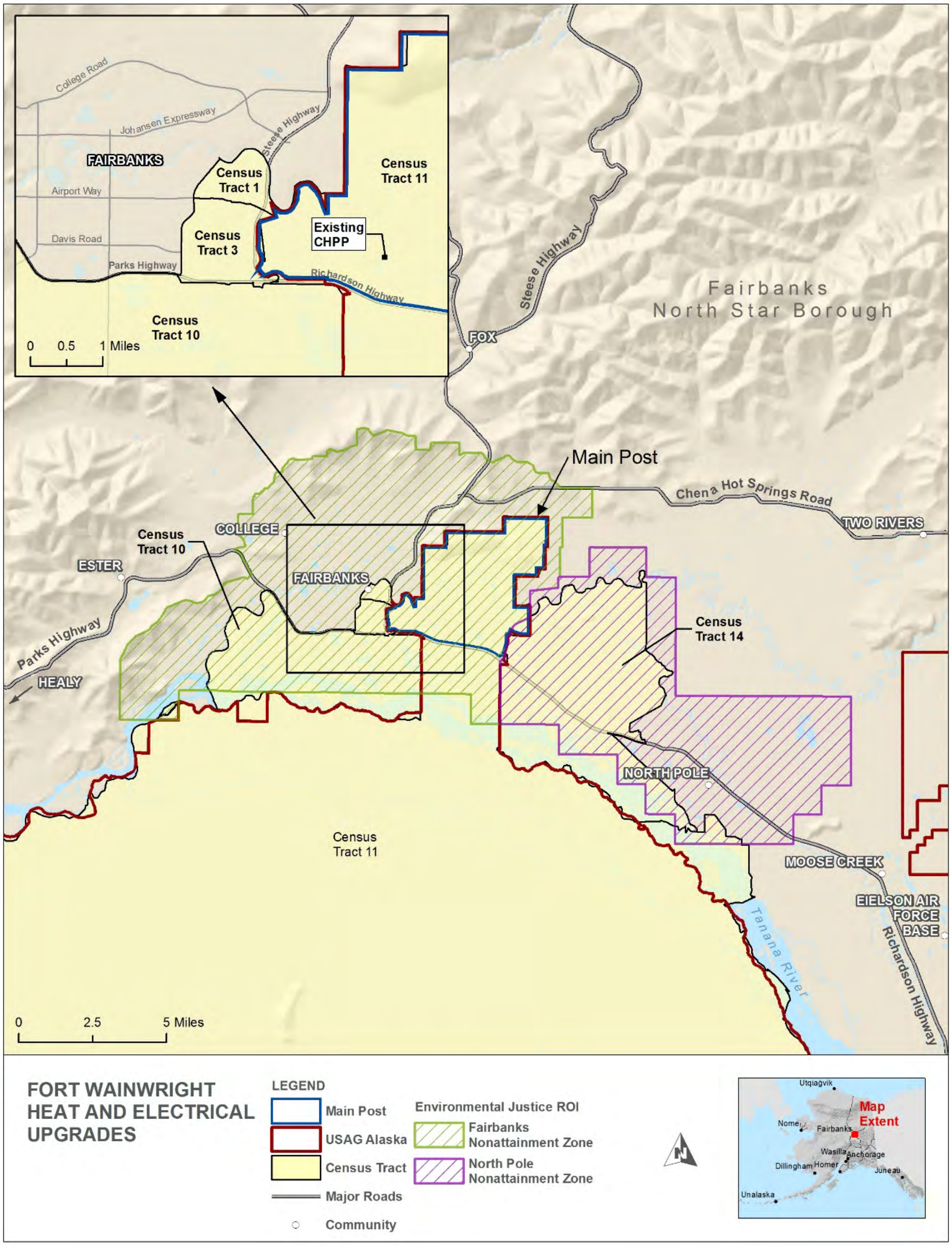


Figure 3.6-1. Geographic Areas in the Environmental Justice ROI

EO 12898 also requires that federal agencies analyze the environmental effects, including human health, economic, and social effects, of federal actions on tribal populations. None of the communities in the ROI are associated with federally recognized tribes. Consultation with tribes is discussed in Section 3.13, Cultural Resources.

3.6.1.2 Environmental Laws, Regulations, and Executive Orders

Minority and Low-Income Populations

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, pertains to environmental justice issues and relates to various socioeconomic groups and the disproportionate effects that could be imposed on them. This EO requires that the actions of federal agencies substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in EO 12898.

Children's Environmental Health and Safety

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." Specifically, the EO requires an evaluation about whether a proposed action would have disproportionate environmental health and safety effects on children.

3.6.1.3 Current Condition

Following 1997 CEQ guidelines for environmental justice analyses, this analysis identified a census tract or community within the ROI as an area of potential environmental justice concern if (1) the minority population exceeds 50 percent or (2) the minority or low-income population percentage is meaningfully greater than the minority or low-income population percentage in a reference population. For the purposes of this analysis, the reference population is the population of Alaska. The decision threshold when there is a "meaningfully greater" percentage of minority or low-income individuals than in the reference population is based on the following equation:

> (minority or low-income population in ROI census tract or community/total population in ROI census tract or community)
>
> divided by
>
> (minority or low-income population in reference area/total population in reference area)

If the equation results in a number greater than one, a greater proportion of minority or low-income individuals resides in the ROI census tract or community than in Alaska as a whole.

Table 3.6-1 presents race, ethnicity, and poverty data for the ROI. For the purposes of comparison, all information in the table is based on 2017 American Community Survey 5-year estimates (USCB 2019). Areas of potential environmental justice concerns in the ROI, together with the minority and low-income metric upon which the area identifications were based, are shaded in gray in the table.

As shown in Table 3.6-1, USCB data identified two FNSB census tracts in the ROI that met the criteria as areas of potential environmental justice concern based on minority or low-income metrics: Census Tracts 1 and 3. Census Tract 11, which encompasses Fort Wainwright, and the FNSB as a whole did not have minority populations that were greater than 50 percent of the population and did not have minority population percentages meaningfully greater than the minority population percentage of 34.7 percent for the State of Alaska nor did they have a low-income population percentages meaningfully greater than the low-income population percentage of 10.2 percent for the State of Alaska.

Among the nine FNSB communities in the ROI, two met the criteria as areas of potential environmental justice concern based on minority and/or low-income metrics: Fairbanks and Fox. The USCB data did not identify Healy, where most of the coal mine employees live, as an area of potential environmental justice concern based on minority or low-income metrics. The Denali Borough as a whole, however, had a low-income population percentage meaningfully greater than the percentage for Alaska.

Healy is the home of Alaska's only operating coal mine, and the mine directly or indirectly accounts for many of the jobs in the community. Although Healy is primarily a coal-mining town, tourism also greatly affects the economy during summer months (see Section 3.5, Socioeconomics). The community had a population of 1,057 in 2018. The minority proportion of the population is 21 percent, and the low-income proportion is 8 percent (see Table 3.6-1). In comparison, 35 percent of the population of the State of Alaska as a whole identify themselves as minority group members, and 10 percent live below the poverty threshold.

Table 3.6-1. Race, Ethnicity, and Poverty Data for Geographic Areas in the ROI

Location	Total Population	White[a] (%)	Black or African American[b] (%)	Alaska Native and American Indian[b] (%)	Native Hawaiian and Other Pacific Islander[b] (%)	Asian[b] (%)	Some Other Race (%)	Hispanic or Latino[c] (%)	Total Minority[d] (%)	Individuals Living in Poverty[e] (%)
Alaska	738,565	65.3	3.2	14.2	1.2	6.2	1.4	6.8	34.7	10.2
Fairbanks North Star Borough	100,031	76.2	4.2	6.8	0.5	3.1	1.0	7.7	23.8	7.7
Census Tract 1	1,330	73.4	2.1	14.4	0.0	2.2	0.0	6.5	26.6	15.4
Census Tract 3	4,087	47.8	11.8	17.0	0.1	6.6	0.4	5.9	52.2	18.9
Census Tract 10	1,633	81.0	1.2	7.7	1.0	0.0	0.0	0.6	19.0	6.2
Census Tract 11[f]	9,219	70.1	12.0	1.1	1.1	4.6	2.3	18.2	29.9	6.7
Census Tract 14	6,842	83.6	2.2	3.3	0.0	1.3	0.4	5.2	16.4	6.9
College	14,362	71.1	5.1	7.5	0.4	5.1	0.2	5.1	28.9	5.4
Fairbanks	31,853	65.3	8.3	8.7	1.3	5.0	1.9	11.9	34.7	11.9
North Pole	2,319	78.8	8.5	2.9	0.0	4.2	0.3	1.0	21.2	8.6
Denali Borough	2,303	83.0	0.2	2.2	0.0	4.7	0.2	0.7	17.0	15.5
Healy	1,098	79.4	0.0	1.1	0.0	8.0	0.0	0.0	20.6	7.8

Notes:

Source: USCB 2019

a. Alone, non-Hispanic or Latino.

b. Alone or in combination with one or more other races.

c. Of any race.

d. Total minority – 100 percent minus "White, non-Hispanic or Latino."

e. Population for low-income population identification differs from total population.

f. Census Tract 11 encompasses Fort Wainwright.

Several facilities on the Fort Wainwright Main Post are sensitive receptors (i.e., schools, a daycare facility, a fitness center, and a recreation center) in which a large number of children may gather at some point during an average week; however, only one of these facilities—the Physical Fitness Center, located near the intersection of Oak Avenue and Meridian Road—is located within 200 feet of the project site. Aside from this facility, two other facilities—the Outdoor Recreation Center, located near the intersection of Glass Drive and Gaffney Road, and the Child Development Center I, located near the intersection of 600th Street and Gaffney Road—are close to the route that traffic related to project construction would take to get to and from the project site. In addition to these facilities, children reside with their families in on-post housing, use sidewalks, and possibly recreate within 200 to 300 feet of the proposed construction traffic routes. Off-post, no facilities that host a large number of children during an average week are known to be located within 200 to 300 feet of the proposed project construction routes, but some children may reside in off-post homes or use sidewalks and recreation areas that are located within this distance of the routes.

3.6.2 Environmental Consequences

3.6.2.1 Significance Criteria

An impact on environmental justice would be considered significant if the Army action were to result in either of the following:

- Disproportionate high and adverse economic, social, or health impacts on minority or low-income populations
- Substantially disproportionate environmental health or safety risks to children

As directed by EO 12898, the analysis considers the following factors when determining whether effects are disproportionately high and adverse:

- Whether there is or would be an impact on the natural or physical environment that significantly (as defined by NEPA) and adversely affects a minority, low-income, or tribal population. Such effects may include ecological, cultural, human health, economic, or social impacts on minority, or low-income communities when those impacts are interrelated to impacts on the natural or physical environment.
- Whether environmental effects are significant (as defined by NEPA) and are or may have an adverse impact on minority, low-income, or tribal populations that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.
- Whether the environmental effects occur or would occur in a minority or low-income population affected by cumulative or multiple adverse exposures from environmental hazards.

With respect to the Proposed Action, the primary factors that may result in disproportionately high and adverse effects on minority and low-income populations include changes in socioeconomic (e.g., income, housing, employment) and human health and safety resources. Potential changes to these resources under each alternative are discussed in detail in Section 3.5, Socioeconomics, and Section 3.10, Human Health and Safety, respectively.

3.6.2.2 No Action Alternative

Under the No Action Alternative, long-term, minor to moderate, adverse impacts on environmental justice populations would be expected. USAG Alaska would continue to use the existing CHPP and utilidor system. Although CHPP emissions are within air quality thresholds, the emissions from coal combustion at the CHPP would continue to be a potential source of health problems for the populations of Fairbanks and surrounding communities within the FNSB CO maintenance area and the serious nonattainment area for $PM_{2.5}$ (see Figure 3.6-1). As shown in Table 3.6-1, some census tracts and communities in these areas contain concentrations of minority and/or low-income populations. The adverse health impacts on minority or low-income populations resulting from air pollution would likely be somewhat greater than those experienced by non-minority or non-low-income members of the general population who also reside in the affected areas. Although minority or low-income populations would not be expected to experience higher exposures to the environmental hazards, these population groups tend to be more burdened with adverse health conditions that either have environmental triggers or affect similar physiological systems as environmental hazards, such as cardiovascular disease, preterm birth, low birth weight, and asthma (EPA 2016). These pre-existing disease and adverse health conditions can increase susceptibility to the effects of exposure to environmental hazards. For example, American Indian/Alaska Natives are at greater risk of serious health effects from particle air pollution because of the relatively high prevalence rate of asthma, cardiovascular disease, and diabetes in this ethnic group (American Lung Association [ALA] 2018, U.S. Department of Health and Human Services [DHHS] 2019). Evidence shows that people who have low incomes also may face higher risk from air pollution (ALA 2018). To the extent that CHPP operation contributes to air pollution in the Fairbanks area, the No Action Alternative could have a disproportionately high and adverse impact on the health of minority and low-income populations in the area.

Under the No Action Alternative, short-term, minor adverse impacts on traffic may occur as a result of the utilidor upgrades and replacements (see Section 3.9, Transportation and Traffic). As described in Section 3.10, Human Health and Safety, the repairs and upgrades would be completed under SOPs designed to protect human health and safety; therefore, no minority or low-income populations would incur disproportionate effects.

The CHPP and utilidor infrastructure are well beyond their life expectancies, and to the extent that failures result in loss of heat and power in the winter, the No Action Alternative could have moderate to significant adverse impacts on both the mental and physical health of Fort Wainwright residents as stated in Section 3.10, Human Health and Safety). These impacts would not affect minority or low-income residents of Fort Wainwright any more than non-minority or non-low-income residents.

Under the No Action Alternative, minor and temporary increases in employment and income would be expected as a result of the plant repairs and upgrades noted above. See Section 3.5, Socioeconomics. These socioeconomic benefits would accrue to minority and low-income populations in the ROI as well as the general population.

Adverse impacts on air result in environmental health and safety risks that could especially affect children. Some physiological and behavioral traits of children render them more susceptible and vulnerable than adults to health risks associated with environmental hazards (EPA 2008). Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed and more easily harmed. To the extent that CHPP operation contributes to air pollution in the Fairbanks area, the No Action Alternative could have minor to moderate adverse impacts on the health of children in the area.

3.6.2.3 Alternative 1 (Build a New Coal CHPP)

Under Alternative 1, long-term, minor to moderate, adverse and beneficial impacts on environmental justice and child populations would be expected. Although coal would be retained as the primary fuel, modern technology for minimizing emissions would be expected to reduce emissions that contribute to health problems from those under the No Action Alternative. These health benefits would apply similarly to minority and low-income populations in the ROI as the general population.

It is not anticipated that traffic related to construction and demolition activities occurring under Alternative 1 could have a disproportionately high and adverse impact on the health and safety of minority or low-income populations. Although it is expected that trucks hauling construction materials and demolition debris would have a short-term, minor impact on traffic volume on the haul route roads, the roads to be traveled are separated from residences by trees, berms, landscaping buffers, or fencing for most of their length, and these routes are currently heavily travelled by trucks.

Employment opportunities related to construction and demolition activities would be short term. Temporary workers would come from the FNSB labor pool and/or would temporarily relocate from elsewhere in Alaska or the contiguous United States (see Section 3.5, Socioeconomics). The beneficial impacts of new employment opportunities on minority and low-income populations would be similar to those experienced by non-minority or non-low-income members of the general population. It is not anticipated that the duration of construction and demolition work would be long enough to induce any permanent changes to regional demographics or housing.

The reduction in coal power plant emissions and resulting improvement in air quality expected to occur under Alternative 1 would have a beneficial impact on children’s health.

During the project construction and demolition phase, construction and demolition contractors would be required to erect temporary project safety fencing around the entire perimeter of the project site. Consequently, it is anticipated that onsite construction and demolition activities would not pose harm to children on the Main Post.

Three on-post facilities—the Physical Fitness Center, Outdoor Recreation Center, and Child Development Center I—are locations where a large number of children may gather at some point during an average week and are located adjacent to potential routes that truck traffic related to project construction and demolition would use. Although it is anticipated that trucks involved in project construction and demolition activities would have a short-term, minor impact on traffic volume on existing roads in and off the installation, these roads are already heavily travelled by trucks. Truck operators would be expected to comply with all laws and regulations that govern the transportation of demolition and hazardous material debris and to follow posted speed limits and other roadway safety measures. As a result, it is anticipated that traffic related to construction and demolition activities would not pose harm to children on or off the installation.

3.6.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Under Alternative 2, long-term, minor to locally significant, adverse and beneficial impacts on environmental justice and child populations would be expected. The replacement of the existing CHPP with a natural gas-fired power plant would result in health and safety benefits for minority and low-income populations. Because natural gas facilities generate fewer emissions than state-of-the-art coal-fired facilities, air emissions would be expected to be somewhat cleaner than those under Alternative 1 as well as the No Action Alternative (see Section 3.10, Human Health and Safety). Switching to natural gas on the installation, however, could increase utility rates in Fairbanks, affecting low-income populations in particular, but these effects would not be disproportionate.

The potential adverse health and safety and socioeconomic impacts of construction and demolition activities, including the beneficial impacts of new employment opportunities, occurring under Alternative 2 would be the same as discussed for Alternative 1.

As described in Section 3.5, Socioeconomics, switching the fuel for the CHPP from coal to natural gas would result in a significant sales decrease at the coal mine in Healy, which, in turn, would result in a substantial reduction in employment and income in the community. As shown in Table 3.6-1, minority and low-income populations account for lower proportions of the total Healy population than they do for the State of Alaska population as a whole. Moreover, a reduction in jobs at the coal mine would have an adverse economic effect on the inhabitants of Healy, regardless of their racial/ethnic background. Consequently, the adverse economic impacts of mine job losses on Healy's minority population would be expected to be similar to those experienced by the general population of the community. If the loss of high-paying jobs at the mine results in displacement of low-paid workers in other parts of the local economy, such as the retail and service sector, Healy's low-income households could experience disproportionately high and therefore significant localized adverse economic effects because, as with low-income households across the country, they have fewer financial resources to cope with job losses and a general economic downturn in the community.

The reduction in coal power plant emissions and resulting improvement in air quality expected to occur under Alternative 2 would have a beneficial impact on children's health.

3.6.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Under Alternative 3, long-term, minor to locally significant, adverse and beneficial impacts on environmental justice and child populations would be expected. The potential adverse health and safety impacts of construction and demolition activities occurring under Alternative 3 would be the same as discussed for Alternatives 1 and 2.

In general, health and safety and socioeconomic impacts, including the beneficial impacts of new employment opportunities, for minority and low-income populations and for children would be the same as those discussed for Alternative 1.

As described in Section 3.5, Socioeconomics, the transition of USAG Alaska to a decentralized heat and power model would result in a significant sales decrease at the coal mine in Healy, which, in turn, would result in a substantial reduction in employment and income in the community. As under Alternative 2, Healy's low-income households could likely experience disproportionately high and therefore significant localized adverse economic effects because, as with low-income households across the country, they have fewer financial resources to cope with job losses and a general economic downturn in the community.

3.7 Noise

3.7.1 Affected Environment

The ROI for noise is defined as the area surrounding the existing CHPP and any area adjacent to proposed construction and operation activities. This area is essentially the Fort Wainwright Main Cantonment Area.

3.7.1.1 Definition of Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, can be steady or impulsive, and can involve a number of sources and frequencies. Human responses to similar noise events are influenced by many factors, including the type of noise, the type of activity during which the noise occurs, the distance between the noise source and the receptor, the time of day, and noise sensitivity of the individual.

Sound intensity is quantified using decibels (dBs), a measure of sound pressure level. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. In some instances, A-weighting may be applied to the dB to approximate a frequency response expressing the perception of sound by the human ear and deemphasizing the higher and lower frequencies that the human ear does not perceive well. The unit for this type of measurement is an A-weighted decibel (dBA). Sounds encountered in daily life, their approximate noise levels, and the average human responses, are provided in Table 3.7-1.

Table 3.7-1. Common Sounds

Noise Level (dB)	Common Sound	Average Human Response
10	Leaves rustling, calm breathing	Negligible
30	Soft whisper	Very quiet
50	Quiet urban daytime	Quiet
60	Normal conversation	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock	Annoying
90-100	Heavy truck, city traffic, or gasoline lawnmower	Very annoying
110	Impact pile driver	Strained vocal effort
120	Jet take-off at 200 feet or auto horn at 3 feet	Maximum vocal effort
140	Carrier deck jet operation	Very loud
150	Jet engine at 160 feet	Painfully loud

Sources: EPA 1971, EPA 1981

Equivalent sound level (L_{eq}) and day-night sound level (DNL) are other metrics that have been developed to describe noise. L_{eq} is the average sound level in dB of a given event or period of time. DNL is the average sound energy in a 24-hour period with a penalty of 10 dB added to nighttime (10 p.m. to 7 a.m.) levels. DNL is a useful descriptor for aircraft noise because it: (1) averages ongoing yet intermittent noise, and (2) measures total energy over a 24-hour period. Similar to A-weighting applied to dBs, A-weighting may also be applied to DNL, and is known as A-weighted day-night sound level (ADNL). Military impulsive sounds (e.g., explosions, artillery blasts) can be felt as well as heard and use C-weighting, in which the low-frequency components of these sounds are not de-emphasized to the same extent as in A-weighting. This metric is known as C-weighted day-night level (CDNL). DNL provides a measure of the overall acoustical environment, but it does not directly represent the sound level at any given time.

The range of audible sound levels for humans is considered to be zero to 130 dBA. It is widely acknowledged that most humans can just barely perceive a noise level change of 3 dBA and that the threshold for perception of a noise level change is 5 dBA. A noise level that increases by 10 dBA is typically perceived as being twice as loud as what was previously heard, and a noise level that decreases by 10 dBA is perceived as being half as loud. Atmospheric conditions such as wind, temperature gradients, and humidity can change how sound propagates over larger distances and can affect the level of sound received at a given location. Ground surfaces can also affect sound propagation; for example, sound traveling over an acoustically absorptive surface such as grass will weaken at a greater rate than if the sound was traveling over pavement or ice. Barriers such as buildings and topography that block the line of sight between a noise source and receptor can also weaken the propagation of a sound (USAG Fort Wainwright 2017b).

3.7.1.2 Environmental Laws, Regulations, and Executive Orders

The following environmental laws, regulations, and EOs are relevant for an evaluation of noise in the current condition and environmental consequences:

- *AR 200-1 (Environmental Protection and Enhancement).* Major program goals include control operational noise to protect the health and welfare of people on- and off-post, reduce community annoyance from operational noise to the extent feasible, and actively engage local communities in land use planning in areas subject to high levels of operational noise and in areas with a high potential for noise complaints. The regulation also defines noise limits for Noise Zones I, II, and III, and provides thresholds for the risk of noise complaints. See Section 3.7.1.3 for more information on Army noise policy and program requirements in AR 200-1.
- *42 U.S.C. § 4901 et seq. (Noise Control Act of 1972).* The Noise Control Act established a national policy to promote an environment free from noise that jeopardizes human health and welfare. It serves to establish a means for effective coordination of federal research and activities in noise control; authorizes the establishment of federal noise emission standards; provides information to the public respecting noise emissions; and directs federal agencies to comply with applicable federal, state, and local noise control regulations.
- *29 CFR § 910.95 (Occupational Noise Exposure)*. OSHA established standards that regulate occupational noise exposure. The minimum requirement states that constant noise exposure for workers must not exceed 90 dBA during an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA, and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure to 140 dBA. If noise levels exceed these standards, employers are required to provide personal protective equipment (PPE) to reduce sound levels to acceptable limits.

The City of Fairbanks does not have a specific noise ordinance that sets quantitative noise standards; however, construction noise is addressed qualitatively under *Fairbanks General Code*, Chapter 46, Article II, Section 46.42(a)(3) (Disturbing the Peace):

> A person commits the offense of disturbing the peace if he: (3) Between the hours of 11:00 p.m. and 7:00 a.m., operates or uses a pile driver, pneumatic hammer, bulldozer, road grader, loader, power shovel, derrick, backhoe, power saw, manual hammer, motorcycle, snow machine, or other instrument, appliance or vehicle

which generate loud sounds, after having been informed by another that such operation or use is disturbing the peace and privacy of others.

3.7.1.3 Current Condition

Noise sources around the Fort Wainwright Main Post are mainly associated with neighborhood vehicular traffic along major arterial roadways, large and small caliber weapon firing from the live-fire training ranges south of the Main Post, and aircraft from Ladd Airfield (USAG Fort Wainwright 2017a).

The primary noise sources from live-fire training areas include various small firearms, such as pistols and rifles, and large-caliber weapons, such as grenades and other artillery. Small arms, demolition, and large-caliber weapons training occurs throughout the small arms complex, south of the Main Post, and can produce impulsive noise pressures up to 130 dB (USAG Fort Wainwright 2017b). The main aircraft noise sources at the installation are helicopters, such as UH-60 Blackhawks, AH-64 Apache, and CH-47 Chinooks, from the USARAK Aviation Task Force; the MQ-IC Gray Eagle unmanned aerial system; and during the summer months, the Bureau of Land Management (BLM) Alaska Fire Service aircraft that are based at Fort Wainwright. Large transient aircraft such as C-5s and C-17s use the airfield infrequently. Generally, aircraft activity occurs Monday through Friday between 8:00 a.m. and 11:30 p.m. and can produce short-term sound pressure levels up to 105 dB (USAG Fort Wainwright 2017a).

Sensitive noise receptors are facilities or land use areas that are the most sensitive to noise and include residences, schools, churches, hospitals, and community facilities. Within Fort Wainwright, the closest noise-sensitive receptors to the current coal-fired CHPP include a military family housing (MFH) area approximately 0.3 mile west, the Bassett Army Community Hospital 0.4 mile northwest, the Fort Wainwright Army Education Center approximately 0.6 mile west, the Kamish Soldier Centered Medical Home about 0.6 mile southeast, and an outdoor sporting/recreation area 0.25 mile southeast of the power plant. The nearest sensitive receptor outside of Fort Wainwright is a residential neighborhood adjacent to the northwest installation perimeter, approximately 1.1 miles from the current coal-fired CHPP.

Although components of the current coal-fired CHPP, such as fans, boilers, transformers, condensers, and generators, are noisy from the inside, noise from operation of the CHPP is not noticeable outside the building. Generally, noise from the current coal-fired CHPP is contained within the building footprint and cannot be detected by noise-sensitive receptors or within the off-post community. Regular coal delivery by rail increases the noise level to some degree, but incompatible noise levels do not occur.

Noise Zones

Noise Zones are represented by areas on a map bounded by noise contours, which represent equal levels of noise exposure as determined by noise models. The Army utilizes Noise Zones as a means of relating diverse sounds to one another; for example, the distant frequent rumbling of a helicopter and the intermittent and loud pops caused by a single small-arms firing event. Table 3.7-2 provides a general overview of the Army Noise Zones, in accordance with AR 200-1. The Land Use Planning Zone (LUPZ) is a subdivision of Noise Zone I and represents noise 5 dB lower than Noise Zone II. Generally, noise-sensitive land uses such as residential neighborhoods and community facilities are compatible within LUPZs, but are not compatible with Noise Zones I or II, and are not acceptable within Noise Zone III. These guidelines are only applicable to aircraft and large- and small-caliber weapon firing activities and are primarily focused on preventing noise-sensitive uses in areas that may be subject to substantial levels of military-generated noise. The existing coal-fired CHPP and adjacent sensitive noise receptors, including the MFH area immediately west of the site and the recreation area to the southeast, are within Noise Zone II for the small-arms range complex, which undergoes a peak noise level of 87 to 104 dB. Additionally, under unfavorable weather conditions, the CHPP and noise-sensitive receptors, including the MFH area to the west, the recreation area and the Kamish Soldier Centered Medical Home to the southeast, and the Bassett Army Community Hospital, are within Noise Zone II, and can experience noticeable sound pressure from 115 to 130 dB because of demolition and large-caliber weapons training activities (USAG Fort Wainwright 2017b).

Table 3.7-2. Noise Zone Descriptions and Limits

Noise Zone	General Description	Noise Limits (dB)		
		Aviation (ADNL)	Impulsive (CDNL)	Small Arms (dB Peak[a])
LUPZ	Noise-sensitive land uses are generally acceptable.	60-65	57-62	N/A
I	An area of moderate to minimal noise exposure.	<65	<62	<87
II	Considered an area of significant noise exposure.	65-75	62-70	87-104
III	Considered an area of severe noise exposure.	>75	>70	>104

Notes:
Sources: AR-200-1, USAG Fort Wainwright 2017b.
a. dB Peak is a single-event sound level without frequency weighting.

Construction Noise

Construction can cause an increase in sound that is well above ambient levels. A variety of sounds are emitted from loaders, trucks, saws, and other construction equipment. Noise levels associated with common types of construction equipment are listed in Table 3.7-3. Construction typically exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and by up to 35 dBA in a quiet suburban area. Construction noise is short term because it only results when construction activities are occurring.

Table 3.7-3. Average Noise Levels for Common Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)	Predicted Noise Level at 500 feet (dBA)	Predicted Noise Level at 1,000 feet (dBA)
Clearing and Grading			
Grader	80-93	60-73	54-67
Truck	83-94	63-74	57-68
Excavation			
Backhoe	72-93	52-73	46-67
Jackhammer and rock drill	81-98	61-78	55-72
Construction			
Concrete mixer	74-88	54-68	48-62
Welding generator	71-82	51-62	45-56
Pile driver	91-105	71-85	65-78
Crane	75-87	55-67	49-61
Paver	86-88	66-68	60-62
Demolition			
Dozer/tractor/front loader	75-80	55-60	49-54

Sources: AR-200-1, Tontechnik-Rechner-SengPiel Audio (TRS) undated, USAG Fort Wainwright 2017a

Risk of Noise Complaints

Fort Wainwright receives occasional noise complaints each year from the surrounding community. Most documented complaints are inquiries about noise sources and when noise is expected to cease. Fort Wainwright staff has found that advanced public notice of training schedules decreases the number of calls to the Public Affairs Office, the department responsible for managing noise complaints (USAG Fort Wainwright 2017a). Average noise levels may be the best tool for land use planning and predicting noise complaints, but they may not adequately assess the community's likelihood of submitting a formal complaint. Human perceptibility of noise is subjective and, in many instances, Noise Zones do not indicate possibility for a complaint; however, it is generally understood that noise complaints can be attributed to a specific event rather than average annual noise levels (USAG Fort Wainwright 2017a, 2017b).

AR 200-1 provides thresholds for noise complaint risks. Single event noise limits in Table 3.7-4 correspond to areas of low to high risk of noise complaints. The magnitude of the complaint risk depends on the frequency of the noise, the time of day, atmospheric conditions, and noise sensitivity of the individual. People in an area experiencing peak sound pressure levels between 115 and 130 dB may describe events as noticeable or distinct. At this noise level, there is a moderate risk of receiving complaints. Peak sound pressure levels above 130 dB are generally objectionable, and are often described as very loud and startling; these levels correlate with a high risk of noise complaints (USAG Fort Wainwright 2017b).

Table 3.7-4. Thresholds for Noise Complaint Risks

Risk of Noise Complaints by Level of Noise	Description	Noise Level (dB)
Low	May be audible	<115
Moderate	Noticeable, distinct	115-130
High	Very loud, may startle	130-140
Severe	Risk of physiological damage to unprotected human ears and structural damage claims	>140

Sources: AR 200-1

3.7.2 Environmental Consequences

This section discusses noise from construction and operations, potential changes to land use compatibility from noise, and the potential for human annoyance from noise.

3.7.2.1 Significance Criteria

An impact on noise would be considered significant if the Army action were to result in any of the following:

- Violate any federal, state, or local noise regulation
- Substantially increase areas that are incompatible with noise-sensitive receptors
- Cause an increase in quantity or severity of noise complaints
- Result in noise that would negatively affect the health of the community
- Result in noise that would negatively affect the structural integrity of a building

3.7.2.2 No Action Alternative

Under the No Action Alternative, the existing coal-fired CHPP would continue to operate. There would be minor construction activities relating to plant and utilidor repairs and upgrades; however, because it is assumed that the repairs and upgrades would not require large construction equipment, no noise impacts would occur.

3.7.2.3 Alternative 1 (Build a New Coal CHPP)

Implementation of Alternative 1 would result in short-term, minor, adverse impacts on noise because of construction and demolition activities. Long-term, negligible, adverse impacts would occur from the operation of the new CHPP; however, long-term, minor, beneficial impacts may occur if the supporting infrastructure within the new coal-fired CHPP generates less noise than the comparable infrastructure within the current coal-fired CHPP.

Construction Noise

Under Alternative 1, the majority of construction and demolition activities would occur at the current and proposed CHPP sites, which is adjacent to the existing CHPP, and additional construction activities would occur throughout the steam distribution system. All activity would be contained within the installation boundary. Heavy equipment such as those items identified in Table 3.7-3 would be used and would cause short-term increased noise levels. Individual pieces of heavy equipment typically generate 75 to 95 dBA at a distance of 50 feet. Noise levels at the upper end of this range would be associated with equipment such as pile drivers and would be limited to intermittent spurts.

Several pieces of heavy equipment would likely be used simultaneously during construction and demolition activities. Table 3.7-5 presents typical additive noise levels (dBA Leq) for the main phases of construction and demolition. In general, the addition of a piece of equipment with identical noise levels to another piece of equipment would add approximately 3 dB to the overall noise environment (TRS undated). Additive noise associated with multiple pieces of construction equipment operating simultaneously would increase the overall noise environment by a few dB over the noisiest equipment, depending on the noise levels (EPA 1971, TRS undated).

Table 3.7-5. Additive Noise Levels Associated with Construction

Construction Phase	L_{eq} (dBA at 50 feet)	L_{eq} (dBA at 250 feet)	L_{eq} (dBA at 500 feet)	L_{eq} (dBA at 1,000 feet)
Ground clearing	86	72	66	60
Excavation and grading	91	77	71	65
Foundation	80	66	60	54
Structural	84	70	64	58
Finishing	91	77	71	65

Sources: EPA 1971, TRS undated.

Note: Construction equipment equipped with noise control devices (e.g., mufflers) and use of sound barriers would be expected to result in lower noise levels than shown in this table.

All construction and demolition activities associated with Alternative 1 would be conducted in the context of an active military installation, where aircraft, large- and small-caliber weapons firing, vehicular activity, and other types of noise are typical and part of the ambient noise environment. The closest noise-sensitive receptors to the CHPP site are the Bassett Army Community Hospital 0.4 mile northwest, an MFH area approximately 0.3 mile (1,584 feet) west and an outdoor recreation facility 0.25 mile (1,320 feet) southeast. There are no noise-sensitive receptors within 1,000 feet of the existing and proposed coal-fired CHPP sites, where demolition and construction would occur; however, noise-sensitive receptors may be present near areas where the utilidor system renovations and upgrades would occur. At 1,000 feet, most construction noise would be expected to be at or below 60 dBA; at 500 feet, construction noise would be around 65 dBA; and at 50 feet, construction noise would be near 85 dBA. The closest noise-sensitive receptors located beyond the installation boundary include residential areas approximately 1 mile northwest of the proposed CHPP site. Noise at this distance would be approximately 30 to 40 dBA, consistent with normal ambient levels; therefore, impacts on noise beyond the installation boundary would not occur. Given the temporary nature of proposed construction and demolition activities, and the existing noise environment, short-term adverse impacts on noise would be minor.

Although construction-related noise impacts would be minor, the following BMPs would be performed to further reduce any noise effects:

- Heavy equipment use would primarily occur during normal weekday business hours, typically from 8 a.m. to 6 p.m.
- All heavy construction equipment would include noise abatement components such as mufflers, engine enclosures, engine vibration isolators, or other sound dampening supplements.
- Heavy equipment mufflers would be properly maintained and in good working order.
- Personnel, particularly equipment operators, would use adequate PPE to limit exposure and ensure compliance with federal health and safety regulations.
- All idling equipment would be turned off when not in use.
- Good relationships with the community would be maintained and notices would be published/distributed before noisy operations occur. The community would be provided with frequent updates about when and where construction actions occur.

Operational Noise

New operational noise would be limited to noises generated by the new coal-fired CHPP. Operational noise related to coal delivery and railroad activity would remain unchanged. The completed power plant could emit sound from several sources, including boilers, condensers, steam turbine generators, cooling-towers, transformers, and other equipment; some of which would be within acoustic enclosures that dampen noise. These noise levels would be similar to those emitted by the existing coal-fired CHPP, which are indistinguishable outside the building. Consequently, operational noise resulting from the new coal-fired CHPP would be present within the building, and operational personnel would use appropriate PPE to dampen perceptible sound; therefore, long-term, adverse impacts on noise would not result.

3.7.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Implementation of Alternative 2 would result in short-term, minor, adverse impacts on noise because of construction and demolition activities. Long-term, negligible, adverse impacts would occur from the operation of the new dual-fuel CHPP; however, long-term, minor, beneficial impacts may occur if the supporting infrastructure within the new dual-fuel CHPP generates less noise than the comparable infrastructure within the current coal-fired CHPP.

Construction Noise

Under Alternative 2, construction and demolition activities would occur at the new dual-fuel CHPP site, which is adjacent to the existing CHPP, and at the natural gas pipeline construction areas. Construction of the natural gas pipeline could occur at any location within Fort Wainwright in addition to the City of Fairbanks. Impacts resulting from construction and demolition activities at the CHPP site would be similar to those described under Alternative 1, with additional short-term, minor, adverse impacts on noise that would occur at pipeline construction areas. Pipeline construction activities would involve the use of heavy construction equipment, such as the items identified in Table 3.7-3; however, adverse impacts on noise would be short-term and minor, and all efforts to avoid noise impacts would be maximized.

The closest noise-sensitive receptors to the CHPP site are the Bassett Army Community Hospital 0.4 mile northwest, an MFH area 0.3 mile west, and an outdoor recreation facility 0.25 mile southeast. The closest off-base noise sensitive receptor is a residential area 1 mile northwest of the CHPP site. As stated in Section 3.7.2.3, no noise-sensitive receptors are within 1,000 feet of the CHPP site; however, noise-sensitive receptors may be present near utilidor renovation areas or pipeline construction areas. To prevent possible impacts on noise at sensitive receptors on- and off-installation, the BMPs identified in Section 3.7.2.3 as well as the following additional BMPs would be implemented:

- A construction noise monitoring program would be implemented to limit sound or limit the number of equipment that can be operated at one time.
- Noisier construction activities would be planned to occur during times that would least affect noise-sensitive receptors.
- Uniform noise levels would be maintained and impulsive noises would be avoided.

Operational Noise

Under Alternative 2, new operational noise would be limited to noises generated by the new dual-fuel CHPP, which could propagate from several sources, including boilers, condensers, steam turbine generators, cooling-towers, and transformers. Because regular coal deliveries by rail would cease, a minor decrease in noise generated by rail deliveries would occur. Operational noise levels would be similar to those emitted by the existing coal-fired CHPP, which are indistinguishable outside the building. Consequently, operational noise would only be detectable within the proposed CHPP, and operational personnel would use appropriate PPE to dampen perceptible sound; therefore, long-term, adverse impacts on noise would not result.

3.7.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Implementation of Alternative 3 would result in short-term, minor, adverse impacts on noise because of construction and demolition activities. Long-term, negligible, adverse impacts could occur from the operation of the new distributed boilers; however, long-term, minor, beneficial impacts may occur if the new distributed boilers generate less noise than the infrastructure within the current coal-fired CHPP.

Construction Noise

Construction and demolition activities would occur within and outside the installation boundary under Alternative 3. Demolition activities would be contained within the area of the current coal-fired CHPP, and resulting short-term, minor, adverse impacts on noise would be identical to those described for demolition activities under Alternative 1. The construction for the distributed boilers could occur at any location throughout the Fort Wainwright Main Post. Construction of the natural gas pipeline could also occur at any location within Fort Wainwright in addition to the City of Fairbanks. To prevent impacts on noise from construction at noise-sensitive receptors, such as the Bassett Army Community Hospital and the MFH areas, and noise impacts on the community outside the installation boundary, BMPs identified under Alternatives 1 and 2 in Sections 3.7.2.3 and 3.7.2.4 would be implemented during the construction and demolition period.

Operational Noise

Operational noise would be limited to noises generated by the new distributed natural gas boilers and emergency generators under Alternative 3. Because regular coal deliveries by rail would cease, a minor decrease in noise generated by rail deliveries would occur. Additionally, because of the distributed system, the noise generated from the current, centralized system would cease and could result in long-term, minor, beneficial impacts on noise at receptors adjacent to the existing CHPP site. It is assumed that the distributed boiler system would produce less noise than a centralized system; therefore, beneficial impacts on noise would occur; however, proximity of the boilers to noise-sensitive receptors could cause an adverse impact. Because of the anticipated noise reductions, it is likely that long-term negligible impacts on noise at Fort Wainwright would occur.

3.8 Land Use

This section discusses land use within and adjacent to Fort Wainwright and, specifically, the site of the existing coal-fired CHPP and Proposed Action. Non-historic viewsheds that are not discussed in Section 3.11 are also discussed.

The ROI for land use includes the Fort Wainwright Main Post and a potential corridor for a natural gas pipeline from the City of Fairbanks to on-post. Fort Wainwright is located in central Alaska, approximately 120 miles south of the Arctic Circle, in the Tanana River Valley. The Main Post is approximately 15,536 acres and comprises a majority of the eastern half of the City of Fairbanks. The Main Post is generally bordered on the west by the City of Fairbanks and on the north and east by unincorporated areas of FNSB (USAG Fort Wainwright 2017b).

3.8.1 Affected Environment

3.8.1.1 Definition of Resource

The term "land use" refers to real property classifications that indicate natural conditions or human activity. Natural conditions of property can be described or categorized as unimproved, undeveloped, preservation, or conservation areas. Human land use categories include residential, commercial, industrial, agricultural, institutional, and recreational. In many cases, land use descriptions are codified in installation master planning and local zoning laws. The two main objectives of land use planning are to ensure appropriate growth and compatible uses among adjacent property parcels. In applicable cases, the location(s) and extent of the Proposed Action need to be evaluated for the potential impacts on a project site and adjacent land uses, including relevant land use or zoning requirements. Other factors to consider include existing land use at the project site, types of land uses on adjacent properties and their proximity to the Proposed Action, the duration of a proposed activity, and proposed permanent uses.

A variety of land use planning tools can be used by local governments and Fort Wainwright to help guide the management of compatible land use in and around military installations (USAG Fort Wainwright 2017b):

- *Zoning.* The most common method of land use control in off-installation areas is zoning, or the partitioning of areas into sections reserved for different purposes. This method designates the uses permitted in each parcel of land and normally consists of a zoning ordinance that delineates the various use districts and a zoning map based on the land use element of the community's comprehensive general plan.
- *Easements.* An easement is a legal right to use or enter onto an owner's real property for a specific limited purpose. Easements can be an effective and permanent form of land use control; in many cases, an easement is better than zoning when trying to resolve an installation's compatibility issues. Easements are permanent (with the title held by the purchaser until sold or released), work equally

well within different jurisdictions, are enforceable through civil courts, and often may be acquired.

- *Deed Restrictions and Covenants*. A deed is a document conveying ownership of land from one party to another, and covenants can be added to the deed to specify restrictions on the use of the land. These covenants are in addition to the restrictions already imposed by the current zoning of the property and, in many instances, may supersede zoning by prohibiting specified uses that would otherwise be allowed. Covenants remain in effect for the specified length of the covenant (usually 20 to 30 years), regardless of how often the land is resold. The installation must already own or must acquire the property in order to impose a covenant. When reselling the property, the installation specifies which uses are permitted on the land, thereby preventing incompatible uses (such as residential housing) for as long as the covenant remains in effect (USAG Fort Wainwright 2017b).

Visual resources include buildings, sites, traditional cultural properties, and other features. A viewshed is the geographical area that is visible from a specific location and includes all surrounding points in the line-of-sight with that location. Visual resources and viewsheds can be natural or manmade landscape features that are visually important or have unique characteristics. Objects that obscure or block landscape features or structures that may not be cohesive with the surrounding landscape can affect the integrity of the visual resource or viewshed.

3.8.1.2 Environmental Laws, Regulations, and Executive Orders

The following list identifies federal statutes, and DoD directives and instructions that provide guidance on land use considerations.

- *Department of Defense Instruction (DoDI) 4165.57 (Air Installations Compatible Use Zones)* ensures long-term compatible land use on and in the vicinity of installations by encouraging state and local governments to adopt legislation and compatible land use regulations into their land use planning and control processes. Compatible land use is achieved by participating with communities and other eligible entities to protect land through restrictive use and conservation easements and by implementing minimum necessary acquisition of real property interests to ensure the operational integrity of the installation. The program allows the Army to contribute funds to a partner’s purchase of easements or properties from willing landowners to preserve buffer zones and limit incompatible development in the vicinity of military installations (DoD 2018a).
- *DoDI 4715.24 [The Readiness and Environmental Protection Integration (REPI) Program and Encroachment Management]* establishes policy, assigns responsibilities, and provides procedures for executing the REPI Program in coordination with other encroachment management tools and programs to protect military installations, ranges, and their associated facilities and range infrastructure and airspace from incompatible development and other encroachment threats. The REPI Program is a key tool for combating encroachment that can limit or

restrict military training, testing, and operations. The program protects military missions by addressing regulatory restrictions and land use conflicts that inhibit military activities (DoD 2016a).

- *DODI 4165.70 (Real Property Management)* implements policy under EO 13327 (Federal Real Property Asset Management) to promote the efficient and economical use of federal real property assets and require military agencies to recognize the importance of real property resources through increased management attention, establishment of clear goals and objectives, improved policies, and appropriate levels of accountability (DoD 2018b).

3.8.1.3 Current Condition

Land Use

On-Installation Land Use. Fort Wainwright includes the categories described below (USAG Fort Wainwright 2017a):

- *Airfield:* The airfield land use category encompasses all airfield operations, including runways, taxiways, airfield support facilities, and testing facilities; aviation refueling; and maintenance.
- *Community:* The community land use category allows religious, family support, personnel, professional, medical, commercial, housing, and recreational services.
- *Industrial:* The industrial land use category is designated for production, maintenance, depot, storage facilities, and activities that generate heavy traffic and pollution.
- *Professional/Institutional:* The professional/institutional land use category is designated for non-tactical operations, including military schools, installation headquarters, major commands, and non-industrial research and development.
- *Ranges and training:* This land use category includes areas used for training purposes, weapons demonstration, qualification ranges, combat training, live-fire training, bivouac sites, and maneuver sites.
- *Residential.* The residential land use category includes family and unaccompanied housing.
- *Troop:* The troop land use category includes operational facilities for force readiness, support troop operations for deployable units, and circulation of Soldiers between designated facilities.

Existing land uses at the Fort Wainwright Main Post are identified in Figure 3.8-1. The existing CHPP site is contained within an industrial land use area, which is adjacent to community areas to the north, east, and south and a residential area to the west.

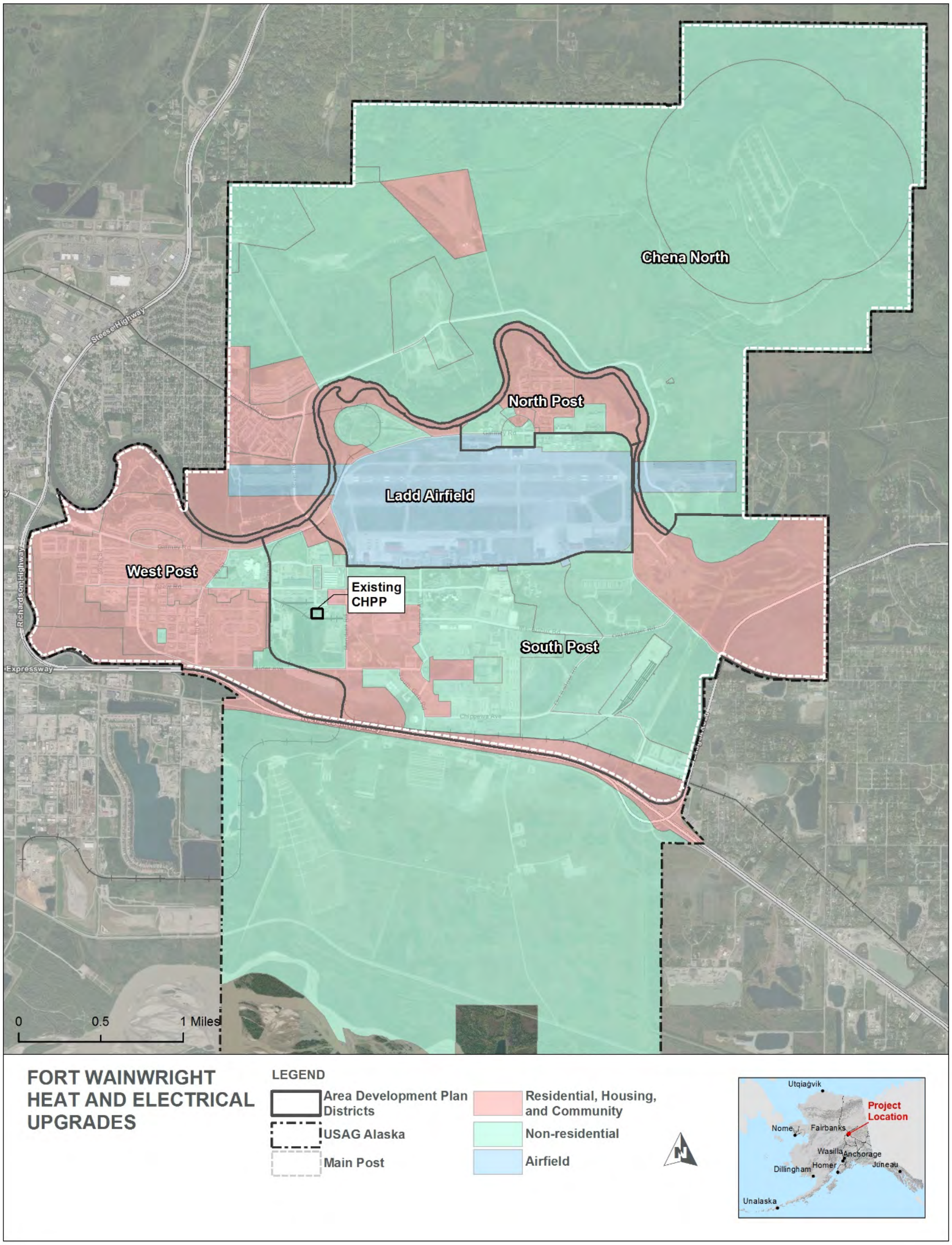


Figure 3.8-1. Existing Land Use on Fort Wainwright Main Post

Off-Installation Land Use. The area of FNSB immediately adjacent to the Main Post includes residential, recreational, commercial, industrial, and institutional land use categories. FNSB has designated zoning districts and implements zoning regulations (FNSB Code of Ordinances, Title 18, Zoning) to implement the FNSB comprehensive plan and designate land use controls. FNSB also administers zoning policy within the City of Fairbanks.

The FNSB comprehensive plan identifies four borough area designations (Outskirt, Perimeter, Rural, and Urban) that are further divided into land categories (FNSB 2019a). The Fort Wainwright Main Post is surrounded by Urban Area to the west and southeast, Perimeter Area to the north and east, and Outskirt Area to the northeast and south. Urban Areas consist of areas that are served or can be served with community water and sewer, and contain the most intensive residential, commercial, and industrial development. The Urban Area west of the Main Post also includes Urban Preferred Commercial and Light Industrial areas, the Perimeter Areas to the north and east include Preferred Residential Land, and the Outskirt Areas to the northeast and south include Reserve Areas (FNSB 2005).

Zoning districts of FNSB surrounding the Fort Wainwright Main Post include residential, recreational, and business to the northwest; residential, commercial, and light industrial to the west; general use and general commercial to the southwest; general use, residential, and heavy industrial to the south and east; and agriculture, residential, and recreational to the north (FNSB 2019b). Portions of the general use, residential, and heavy industrial zoning districts to the south and east of the Main Post are also within the military noise overlay zone; a designation applied to certain existing zoning districts to ensure the health and safety of the public by imposing additional regulations on land use development. Current residential and recreation land uses around Fort Wainwright are compatible with Main Post land uses because they are adjacent to open space and family housing of similar density (USAG Fort Wainwright 2017a).

REPI Program. Fort Wainwright currently utilizes the REPI Program to preserve compatible land uses of properties in and near the installation which helps to avoid noise and land restrictions and improve the resiliency of the mission. Fort Wainwright is currently supporting a project to preserve 569 acres to provide buffer area along the eastern boundary of the Small Arms Complex that will provide noise protection, enhance sensitive wetlands, and provide ecological corridors for wetland species (DoD 2017b).

Real Property Management

The Fort Wainwright Real Property Management Plan (RPMP) provides guidance for future physical development at the installation (USAG Fort Wainwright 2017a). The RPMP was developed using a collaborative approach to identify and consider site limitations and benefits, provide a community that maximizes mission readiness and environmental stewardship, and ensures that Fort Wainwright provides modern and efficient facilities to accommodate multiple functions and uses while considering relationships to adjacent facilities and land uses. To achieve the goals of the RPMP, current and proposed land uses must consider a variety of factors, including the environment, noise, geography, and community safety (USAG Fort Wainwright 2017a).

In accordance with the RPMP, the Fort Wainwright Main Post is organized into five districts based on geographical features, land use patterns, building types, and transportation networks. Each district implements an Area Development Plan (ADP) that guides the adaption of the planning goals and principles of the RPMP. These districts—North Post, West Post, South Post, Ladd Airfield, and Chena North—are identified in Figure 3.8-1. The existing CHPP site is contained within an industrial land use area, located within South Post. The Proposed Action within the installation may occur in the South Post or throughout the entire Main Post.

The North Post and the Ladd Airfield contain the Ladd Field National Historic Landmark (NHL). The North Post Area also includes housing units, professional/institutional facilities like the railway switching yard and warehouse area, and community infrastructure, including trails and parks. The Ladd Airfield Planning District is made up of runways, hangars, and other aviation support facilities, as well as the headquarters for the Alaska Fire Service (USAG Fort Wainwright 2017a).

The West Post primarily contains residential areas and facilities to support family and community living. It consists of mostly housing, small-scale commercial facilities, schools, and recreation areas. Additionally, the Bassett Army Hospital medical complex is located within the district and is heavily trafficked (USAG Fort Wainwright 2017a).

The South Post is an industrial area separated from the West Post by a small buffer zone. It includes the following (USAG Fort Wainwright 2017a):

- Current coal-fired CHPP and storage, supply, and maintenance facilities in the western portion
- Maintenance, supply, and storage facilities; administration; operations; a sports/fitness complex; Post Exchange; commissary; golf course; and other community and recreation facilities in the central and eastern portions

Chena North is largely rural and undeveloped and contains community, industrial, ranges and training, and residential land use designations. The district is primarily used for range and maneuver/bivouac training, but also supports community services, recreational activities, and residential uses (USAG Fort Wainwright 2017a).

Easements

Through easements and agreements, Fort Wainwright has created a non-DoD, partner-owned buffer of properties, some of which are adjacent to or near the installation. Although Fort Wainwright owns the land, the easement partner is responsible for maintaining the land according to compatible use and development guidelines.

Viewsheds Not Addressed Under Cultural Resources

The natural visual character of the Tanana River Valley includes rolling terrain with dense forests. The *Fort Wainwright Real Property Vision Plan* identifies the current coal-fired CHPP as a “blight” at Fort Wainwright (USACE 2013). In accordance with the vision plan, blights are defined as visual or functional negatives that hinder day-to-day operations of quality-of-life. Vegetated buffers, outdoor open space, recreational trails, and parks are examples of the aesthetic, functional, or operational positives that should be preserved in the long-term planning effort. Fort Wainwright has proposed to add more aesthetic positives to enhance the viewshed, particularly near industrialized infrastructure (USACE 2013).

3.8.2 Environmental Consequences

Effects on land use are assessed by evaluating an action’s consistency and criteria with existing land use plans, zoning, or policies; an action’s alteration of the viability of existing land use; the degree to which an action precludes continued use or occupation of an area; and the degree to which an action conflicts with established planning criteria to ensure the safety and protection of human life and property.

3.8.2.1 Significance Criteria

An impact on land use would be considered significant if the Army action were to result in any of the following:

- Incompatibility with existing Fort Wainwright or FNSB land use designations
- Major conflicts with Army land use plans, policies, or regulations
- Substantial land use conflict with off-post land use
- Site alteration that substantially obstructs viewsheds or the scale or degree of change appears to be a disharmonious modification of the overall view

3.8.2.2 No Action Alternative

Under the No Action Alternative, Fort Wainwright would not replace the current heat and power generation system. Existing land uses would continue in their current states, and there would be no impacts on land use. Additionally, the current coal-fired CHPP would continue to be considered a blight by the Fort Wainwright community.

3.8.2.3 Alternative 1 (Build a New Coal CHPP)

Alternative 1 would have no adverse impacts on land use. Long-term, minor, beneficial impacts on visual resources and viewsheds may occur following the demolition of the current coal-fired CHPP and construction of a new plant. Construction staging/laydown areas, materials and equipment storage areas, and demolition activities would be located within an industrial land use area. To avoid any land use conflicts, construction would be confined to the project site, which is adjacent to the current coal-fired CHPP. No construction activities would occur outside of the installation boundary.

The new CHPP would be constructed in an industrial land use area adjacent to the existing CHPP, which is a continuation of existing uses. Although the new CHPP would be sited in an area that is adjacent to community and residential uses, it would be a continuation of an existing use and would be set back from these areas; therefore, it would be compatible with existing land uses. The new CHPP would not preclude the viability of any existing or future land uses or the continued occupation of the area by incompatible uses. The design and siting of the proposed CHPP would meet all anti-terrorism/force protection requirements and would decrease the current risk to life-safety and mission readiness of the existing CHPP. Therefore, Alternative 1 would not conflict with any land use plans, policies, easements, or zoning designations that govern land uses within Fort Wainwright. Operations would not conflict or change existing land uses and would therefore have no long-term adverse impacts on land use.

The existing CHPP would be demolished following the completion of the new coal-fired CHPP and there would be some opportunity to improve the viewshed considered a blight by the Fort Wainwright community, resulting in a long-term, minor, beneficial impact. Some positive aesthetic features that could be incorporated include parks, vegetated corridors, outdoor open space, and recreational components.

3.8.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Long-term, minor to moderate adverse impacts as well as minor beneficial impacts on land use could occur as a result of Alternative 2. Short-term, adverse impacts on land use would not occur at Fort Wainwright because construction would not conflict with existing land uses, as described under Alternative 1.

Short-term, negligible to minor, adverse impacts on land use within FNSB could occur depending on the location of the new natural gas pipeline from the Fairbanks natural gas utility to the new Fort Wainwright dual-fuel CHPP; type of pipeline construction method; construction staging/laydown areas; and materials and equipment storage areas. It is anticipated that the pipeline would be placed within a zoning district designated for general use or industrial use by FNSB and may be within an existing utility easement or right-of-way. Assuming the natural gas pipeline would be underground, short-term, minor adverse impacts would occur to Fort Wainwright land use during the construction period because of temporary land use incompatibilities. Temporary land use incompatibilities would occur if the industrial nature of the natural gas pipeline construction were to interfere with other zoning districts such as residential, recreational, or community; access to certain areas were temporarily blocked by construction activity; or construction produced short-term annoyances such as noise, traffic, or air emissions.

Long-term, minor to moderate, adverse impacts on land use at Fort Wainwright and FNSB would be anticipated if property needs to be acquired as a result of pipeline construction. To construct a pipeline, the natural gas utility may need to acquire easements from off-installation private landowners and from Fort Wainwright and/or a right-of-way may need to be created. New pipeline corridors from the utility in Fairbanks to the Fort Wainwright CHPP site would be established before construction of the natural gas pipeline. Private landowners would be provided financial compensation for providing the right to construct the pipeline on their properties and for future access to the properties to conduct maintenance and repairs. Land use restrictions on property within the easement and/or right-of-way would prevent the future development of the area. To avoid any land use conflicts, efforts would be made to site and construct all pipeline infrastructure in areas that would be compatible with surrounding land uses.

Long-term, minor, beneficial impacts on visual resources and viewsheds may occur following the demolition of the current coal-fired CHPP and removal of the large coal pile. There would be opportunities to develop other industrial land uses in the area that would be cleared by demolition and removal activities. Trains would no longer use the rail spur adjacent to the existing CHPP to deliver coal, resulting in an overall reduction of train trips through the installation. There would be opportunities to improve the viewshed by placing positive aesthetic features such as trees or other landscape components at the vacant site.

3.8.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Short-term, minor, adverse impacts on land use would occur under Alternative 3 from construction of the distributed boilers throughout the installation and would be influenced by the location of each boiler. Because the natural gas boilers are distributed throughout the installation, construction of the heating system and related infrastructure could conflict with existing land uses. Additionally, a distributed boiler system would be more compact than a centralized system; therefore, the likelihood of the new infrastructure being incompatible with existing land uses would be greatly reduced.

Minor impacts on land use as a result of natural gas pipeline construction would be identical to those discussed under Alternative 2. Impacts on land use as a result of demolition of the existing CHPP, coal pile, and related infrastructure would be identical to those discussed under Alternative 1.

Although the new distributed boilers may be sited in areas that are adjacent to community and residential uses, it is anticipated that new distributed boilers would not impact or interfere with adjacent land uses. The new boilers would not preclude the viability of any existing or future land uses or the continued occupation of the area by incompatible uses. The design and siting of the boilers would meet all anti-terrorism/force protection requirements and would decrease the current risk to life-safety and mission readiness of the existing CHPP. Therefore, Alternative 1 would not conflict with any land use plans, policies, easements, or zoning designations that govern land uses within Fort Wainwright.

Operation of the distributed boilers would not conflict with or change existing land uses and therefore would have no long-term adverse impacts on land use. Following the completion of construction of the new boilers and demolition of the current coal-fired CHPP, there would be opportunities to improve the viewshed considered a blight by the

Fort Wainwright community, which could include adding positive aesthetic features to the area such as trees or other landscape components, resulting in long-term, minor, beneficial impacts.

3.9 Transportation and Traffic

3.9.1 Affected Environment

The ROI for transportation and traffic includes transportation infrastructure throughout the Fort Wainwright Main Post, the area immediately surrounding Fort Wainwright, the regional area of Interior Alaska, and transportation corridors to southern Alaska. The transportation and traffic system includes regional and local roadways, rail lines, and air transportation facilities. The local transportation network at Fort Wainwright is made up of primary, secondary, and residential roads with limited pedestrian and bicycle facilities, vehicle access control points/gates, and parking areas. Pedestrian and bicycle facilities, public transportation systems, and air transportation are not discussed in this section because these components would not be affected by the Proposed Action.

3.9.1.1 Definition of Resource

Transportation and traffic refer to roadway, street, and rail systems, and the movement of vehicles on transportation networks. For the purposes of the Proposed Action, transportation and traffic are described in terms of on- and off-installation road networks, railroad, traffic volumes and congestion, and proximity to the proposed project area.

3.9.1.2 Environmental Laws, Regulations, and Executive Orders

There are no specific federal, state, or DoD regulations for managing or evaluating impacts on transportation and traffic. Maintaining the existing roadway and traffic conditions are usually important factors in federal decisions. Transportation safety should also be maintained during the implementation of a proposed action. The U.S. Department of Transportation (DOT) issues regulations and laws regarding driver safety, vehicle requirements, and rules of the road that should be adhered to at all times.

3.9.1.3 Current Condition

Roadways

Regional roadways beyond Fairbanks and Fort Wainwright that connect with the greater Alaska region to Fort Wainwright and other major cities include George Parks Highway, also known as Parks Highway, Richardson Highway, and Steese Highway, also known as Steese Expressway (Figure 3.9-1). George Parks Highway is one of the most important arterial roads for transportation within Alaska and connects Fairbanks to the principal urban areas of southern Alaska, including Anchorage, approximately 360 miles south, and the Matanuska-Susitna Valley, approximately 250 miles south. Richardson Highway connects Fairbanks to Valdez, a port community 368 miles southeast of Fairbanks. Steese Highway extends 161 miles to the north of Fairbanks to the community of Circle.

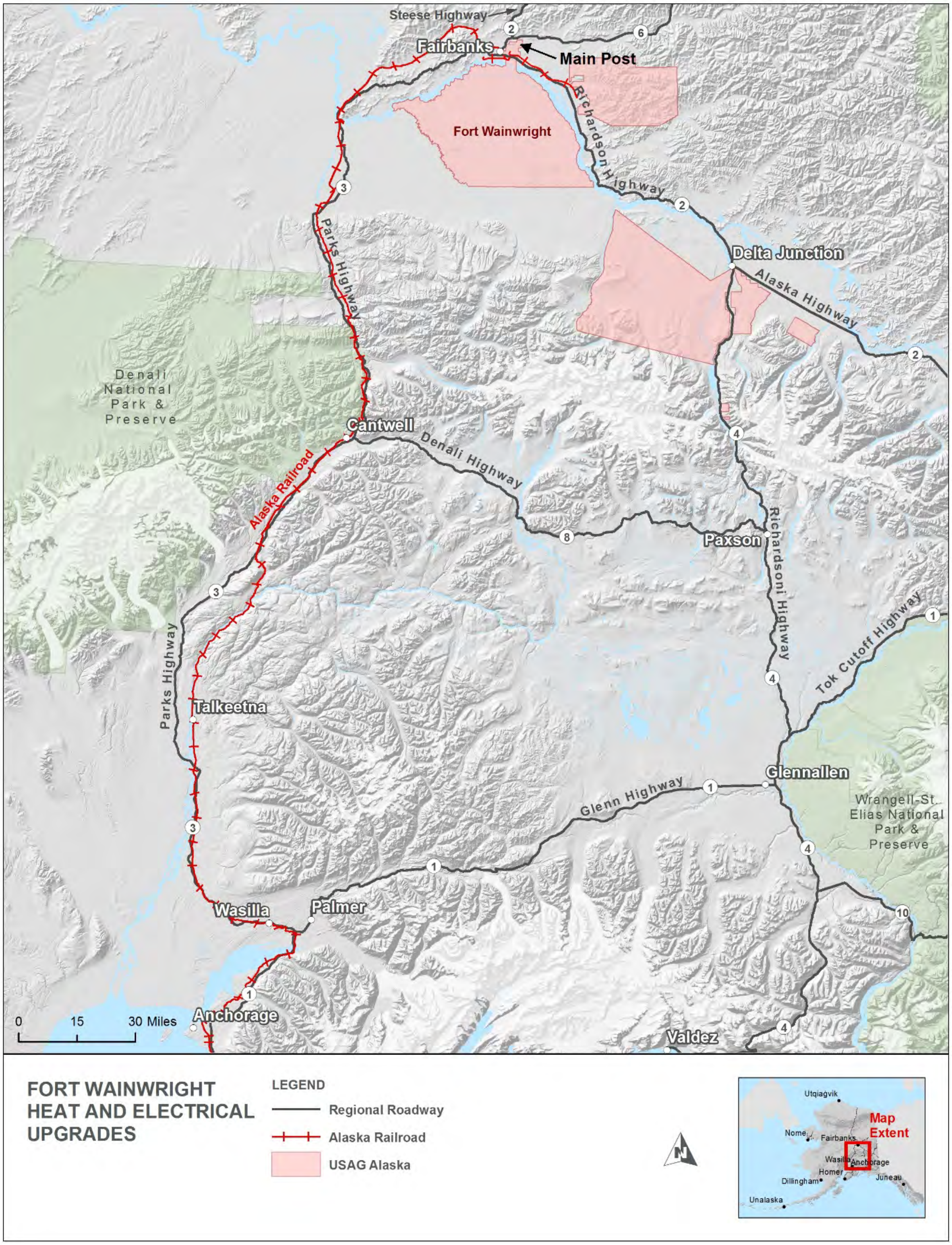


Figure 3.9-1. Fort Wainwright Regional Roadways and Railways

The installation can be accessed by Steese Highway on the western perimeter; Richardson Highway, which bisects the installation dividing the Main Post from the southern portion of the installation; and Robert Mitchell Expressway (Figure 3.9-2). Airport Way is the primary east-west arterial road in Fairbanks, which turns into Gaffney Road and connects with the Main Gate at the western perimeter of the installation. Airport Way also connects Fort Wainwright to FAI on the western side of Fairbanks, the George Parks Highway, and Roberts Mitchell Expressway. College Road and the Johansen Expressway provide major east-west access to the Main Gate and connect Fort Wainwright with the northern part of Fairbanks. Fort Wainwright can also be accessed using West Trainor Gate Road, which intersects Steese Highway east-west, and Trainor Gate at the northwest perimeter of the installation. At the eastern perimeter of the installation, Holmes Road intersects Badger Road and feeds into Montgomery Road where Badger Gate is located (Figure 3.9-2).

Fort Wainwright contains approximately 30 miles of paved roads and 10 miles of gravel/clay/unpaved roads. While unpaved roads serve facilities such as ammunitions storage areas, landfills, and training areas, the roads surrounding the existing CHPP are paved and in good condition (USAG Fort Wainwright 2017a, USAG Fort Wainwright 2013a). The primary roadways that support the majority of installation traffic are Gaffney Road, Montgomery Road, Old Badger Road, Chippewa Avenue, South Gate Road, and Alder Avenue running in the east-west direction and Ketcham Road, Meridian Road, River Road, and Trainor Gate Road, running in the north-south direction. Secondary roadways support local installation traffic and facilitate transportation between adjacent facilities (USACE 2013).

Gaffney Road is the main on-installation arterial roadway that extends from the Main Gate to and nearly bisects the Main Post toward the eastern perimeter. Gaffney Road is a four-lane roadway from the Main Gate to just north of Ladd Army Airfield (AAF), where it continues as a two-lane roadway towards Badger Gate and the eastern installation perimeter. The remaining roadways at Fort Wainwright consist primarily of two-lane roads with either adjacent paved shoulders or sidewalks. Posted speeds at Fort Wainwright range from 20 mph to 35 mph.

The transportation network immediately surrounding the existing CHPP consists of Meridian Road to the east, Alder Avenue to the south, Neely Road to the north, and the Alaska Railroad to the west. The site can be accessed directly by using Oak Avenue, which approaches the CHPP from the east. An all-way stop control exists at the intersection of Meridian Road and Neely Road, and a two-way stop control exists at the intersection of Meridian Road and Alder Avenue. Meridian Road is a two-lane roadway with designated left-turn lanes and merge lanes for incoming right-turning traffic.

Figure 3.9-2. Fort Wainwright On-Installation Roadways

Rail Transportation

The rail line at Fort Wainwright is owned and operated by ARRC. The railroad provides both freight and seasonal passenger train services between Anchorage and Fairbanks, and also connects with Eielson AFB, which is the northern terminus of the railroad, approximately 20 miles southeast of Fort Wainwright (Figure 3.9-1). Most northbound freight to Alaska arrives by sea at either the port of Anchorage or the port of Whittier and is transferred to the railroad. The Alaska Railroad's southern terminus is Seward, which is approximately 80 miles south of Anchorage and the location of the nearest port with intermodal capability (USKH Inc. [USKH] 2009).

The Alaska Railroad main line serving Fairbanks and Fort Wainwright crosses the city north of the Chena River and enters the installation parallel to Trainor Gate Road at Trainor Gate. Approximately 5.2 miles of rail line are located on the installation. Primarily used to transport freight and coal, the Alaska Railroad rail line runs in a north-south direction west of the existing CHPP and includes spur track, or track that diverges from the main line, to the CHPP coal off-loading area. The existing coal-fired CHPP at Fort Wainwright receives coal from a coal mine in Healy, an approximately 115-mile trip by rail. Trains that transport coal to supply the existing CHPP at Fort Wainwright make four round trips per week from Healy, contributing to the 25 total weekly rail round trips for both freight and coal transport for the Alaska Railroad (USAG Fort Wainwright 2017a).

Traffic

The regional roadways used to access Fort Wainwright are primarily Robert Mitchell Expressway, Richardson Highway, Steese Highway, and Badger Road. Traffic levels on these roadways are generally moderate; however, heavier traffic during peak hours and the summer tourist season can cause congestion at major intersections, including Steese Highway/Richardson Highway and Gaffney Road/Airport Way. The Main Gate is located on Gaffney Road. Peak traffic hours for Fort Wainwright and the surrounding Fairbanks region are typically 7:00 a.m. to 8:00 a.m. and 4:30 p.m. to 5:30 p.m. (USKH 2009, USAG Fort Wainwright 2013a).

The Fort Wainwright *Six-Year Transportation Plan Update* was completed in 2009 to provide projected 2015 traffic conditions, including an analysis of 2009 roadway conditions, peak hour traffic, and safety conditions (USKH 2009). As part of the study in November 2005 and October 2007, traffic counts were conducted between 6:30 a.m. and 8:30 a.m. and between 3:30 p.m. and 5:30 p.m. to capture morning and evening peak traffic for each intersection. Traffic volume forecasts for 2015 were developed at 25 key intersections using the 2005 and 2007 traffic count data as part of the Fort Wainwright *Six-Year Transportation Plan Update*.

Inbound and outbound Fort Wainwright traffic uses three main Access Control Points (ACPs): Main Gate, Trainor Gate, and Badger Gate. Peak hour traffic volumes for these gates, based on counts from October 2007, are listed in Table 3.9-1. Traffic counts were conducted between 6:30 a.m. and 8:30 a.m. and between 3:30 p.m. and 5:30 p.m. to capture morning and evening peak traffic for each intersection. Trainor Gate, in particular, experiences more traffic-related congestion because it consists of a single-lane configuration and can be affected when railroad activity temporarily stops traffic flow (USKH 2009).

Table 3.9-1. Peak Hour Volumes for Fort Wainwright Access Control Points

	AM Peak Hour Volume (number of vehicles)	PM Peak Hour Volume (number of vehicles)
Access Control Point	**6:30 a.m. – 8:30 a.m.**	**3:30 a.m. – 5:30 a.m.**
Main Gate	1,308	1,382
Trainor Gate	508	545
Badger Gate	331	430

Source: USKH 2009.

The highest traffic volumes recorded on the installation were on Gaffney Road west of Meridian Road, where volumes ranged from 1,000 to 1,700 vehicles during the p.m. peak hour. The roadways surrounding the current coal-fired CHPP, namely, Montgomery Road, Neely Road, Santiago Avenue, and Meridian Road, carry more than 400 vehicles during the a.m. and p.m. peak hours, and the remaining roadways that were studied carry fewer than 400 vehicles during those peak hours. Additionally, peak-hour traffic volumes on Gaffney Road, Meridian Road, Neely Road, and 9th Street were higher in the evening than in the morning (USKH 2009).

The traffic volumes for these roadways were studied as part of the *Six-Year Transportation Plan Update*. Peak traffic volumes for Meridian Road were highest in the evening with a peak of 200 to 400 vehicles. The projected 2015 volume for Meridian Road was 400 to 800 vehicles at peak p.m. traffic times. Meridian Road intersects Neely Road northeast of the existing CHPP. Higher traffic volumes were reported on Neely Road in the evening, with 400 to 800 vehicles at the peak evening hour. The projected Neely Road/Meridian Road intersection traffic volumes from the study are summarized in Table 3.9-2. Alder Avenue surrounding the existing coal-fired CHPP to the south is a two-lane secondary roadway that is not affected by adverse traffic conditions.

Table 3.9-2. Traffic Volumes for Select On-Installation Intersections

Intersection	2008 Volume		2015 Forecasted Volume		Percent Change	
	Peak a.m.	Peak p.m.	Peak a.m.	Peak p.m.	Peak a.m.	Peak p.m.
Neely Road and Meridian Road	842	1,031	955	1,158	13	12
Gaffney Road at 599th Street	1,384	1,438	1,853	1,760	34	22
Gaffney Road at 10th Street	879	116	1,141	1,376	30	23
Gaffney Road at River/Meridian Road	693	835	1,161	1,143	67	37
Montgomery Road at Meridian Road	1,221	1,391	1,689	1,604	38	15
Montgomery Road at Santiago Avenue	693	757	1,106	1,088	60	44

Sources: USKH 2009.

Level of Congestion

Traffic congestion is characterized by slower speeds, longer trip times, and increased vehicular queuing (queue referring to the number of stopped vehicles in a lane behind the stop line). When roadway demand is high enough to reach or exceed roadway capacity, the speed of traffic decreases and results in congestion.

To estimate the capacity of existing roadway infrastructure to accommodate traffic demand, a traffic analysis was conducted as part of the *Six-Year Traffic Transportation Plan Update* (USKH 2009). Operations of roadway segments and intersections are expressed in terms of Level of Service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. LOS A to F were used to categorize primary on-installation intersections at peak traffic hours. The LOS range from LOS A, best operating conditions, through LOS F, worst operating conditions. LOS E identifies “at-capacity” operations while LOS F identifies over-capacity volumes that result in stop-and-go conditions (Transportation Research Board [TRB] 2000). Table 3.9-3 presents the criteria for each LOS designation and associated delay factors.

The LOS for six key intersections at Fort Wainwright were determined in the 2005–2007 traffic study for the *Six-Year Traffic Transportation Plan Update* and results are summarized in Table 3.9-4. The study includes weekday peak-hour data only.

Table 3.9-3. LOS Designations

LOS	Description	Average Signalized Control Delay (seconds/vehicle)	Average Unsignalized Control Delay (seconds/vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤10.0	≤10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1–20.0	10.1–15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1–35.0	15.1–25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C[a] ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1–55.0	25.1–35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C[a] ratios. Individual cycle failures are frequent occurrences.	55.1–80.0	35.1–50.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0	>50.0

Notes:

Sources: USKH 2009, USAG Fort Wainwright 2017a, TRB 2000

a. V/C – Volume-Demand-to-Capacity

Table 3.9-4. Intersection Analysis and LOS Designation

Intersection	2008 Volume				2015 Forecasted Volume			
	Peak Hour, a.m.		Peak Hour, p.m.		Peak Hour, a.m.		Peak Hour, p.m.	
	Average. Control Delay per Vehicle (seconds)	LOS	Average. Control Delay per Vehicle (seconds)	LOS	Average. Control Delay per Vehicle (seconds)	LOS	Average. Control Delay per Vehicle (seconds	LOS
Neely Road and Meridian Road	19.4	C	25.0	C	25.3	D	82.8	F
Gaffney Road at 599th Street	45.9	E	24.2	C	315.7	F	68.1	F
Gaffney Road at 10th Street	22.9	C	27.4	D	45.3	E	102.8	F
Gaffney Road at River/Meridian Road	8.4	A	11.6	B	17.3	B	27.2	C
Montgomery Road at Meridian Road	11.9	B	12.7	B	105.8	F	82.9	F
Montgomery Road at Santiago Avenue	23.4	C	23.1	C	343.6	F	306.9	F

Source: USKH 2009

According to the 2015 forecasted traffic volumes, the weekday peak-hour traffic greatly affects Gaffney Road at 599th Street, the intersection just east of the Main Gate, and Montgomery Road at Santiago Avenue, the intersection used to gain access to the majority of Fort Wainwright facilities. Additionally, the intersection at Gaffney Road and 10th Street, also used to access Fort Wainwright facilities, and Neely Road at Meridian Road, at the corner of the existing CHPP, operate at LOS F during p.m. peak times. Twenty other intersections were also studied and operate at LOS C or better during both a.m. and p.m. peak times (USKH 2009).

3.9.2 Environmental Consequences

3.9.2.1 Significance Criteria

An impact would be considered significant for transportation and traffic if an Army action were to result in any of the following:

- Cause substantial changes in traffic flow patterns

- Introduce substantial levels of construction traffic on local roads
- Substantially degrade roadways within the ROI
- Causes unacceptable delays in deliveries by rail

3.9.2.2 No Action Alternative

Under the No Action Alternative, traffic and rail patterns would continue in their current state, and there would be no impacts on existing on- and off- installation traffic levels or transportation networks from construction of a new power supply system. Short-term, minor, adverse impacts may occur as a result of the utilidor upgrades and replacements; in which case, construction vehicle traffic as well as roadway interruptions would occur when working on or adjacent to roadways. Short-term, minor, adverse impacts on roads would occur if the roads need to be either fully or partially closed to complete the utilidor replacements, which would cause delays and possible detours. The existing CHPP would require continued delivery of coal via the Alaska Railroad from a local coal mine in Healy. Rail transportation volumes at Fort Wainwright and in the surrounding region would remain unchanged.

3.9.2.3 Alternative 1 (Build a New Coal CHPP)

Alternative 1 would not include construction or modification of any roads or transportation networks. Impacts that may occur from the Proposed Action would primarily be a result of increased traffic volume and not a result of roadway construction or reconfiguration.

Short-term, minor, adverse impacts on transportation and traffic systems at Fort Wainwright would be expected as a result of Alternative 1. Temporary impacts on traffic would occur during the demolition and construction of the existing and proposed coal-fired CHPPs resulting from the introduction of traffic from construction vehicles and construction worker commuting and from the potential road closure due to utilidor renovation that could result in congestion and delays at ACPs and on-installation roadways.

Four general transportation routes could be taken by construction vehicles to access the CHPP site (Figure 3.9-3). Route 1 would require construction traffic to access the installation using the Main Gate on Gaffney Road, turn right onto 10th Street, and then left onto Neely Road where Oak Road, an access road for the CHPP site is located. Route 2 would require construction traffic to use Trainor Gate at the northwest perimeter of the installation, follow River Road which merges with Meridian Road, and access the CHPP site using Oak Avenue. Route 3 would require construction traffic to access the installation using Badger Gate, and to travel west through the installation using Old Badger Road, MacArthur Avenue, and Oak Avenue to access the CHPP site.

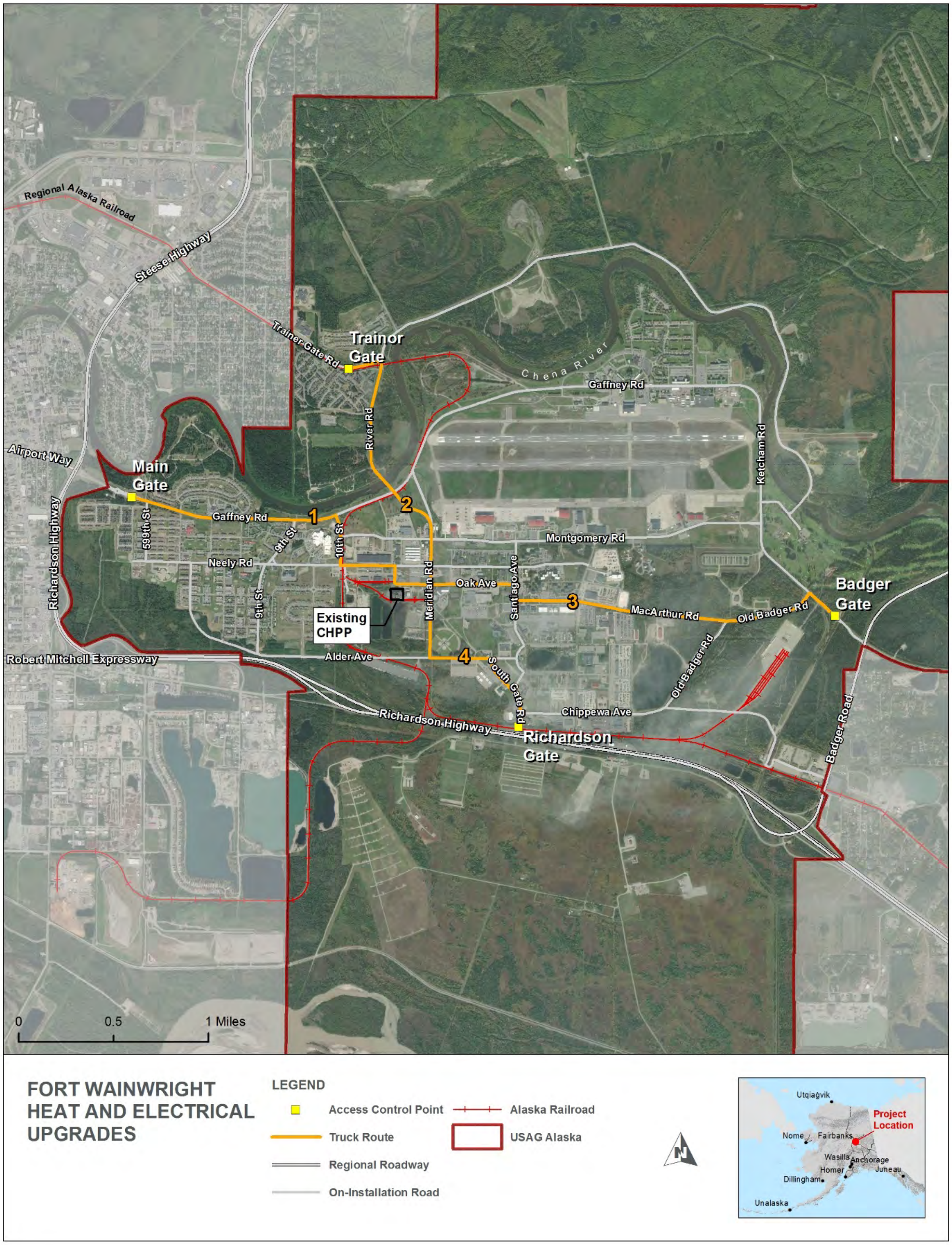


Figure 3.9-3. Fort Wainwright Construction Traffic Travel Routes

Construction traffic using Route 4 would access the installation using Richardson Gate, and travel to the CHPP site via South Gate Road, Alder Avenue, and Meridian Road. Estimated travel distances and times for each route are included in Table 3.9-5. Route 3 is the longest route within the installation that construction traffic would take and, therefore, would require the most travel time. Although Route 4 represents the shortest travel distance within the installation, it requires the use of Richardson Gate, which is closed to all traffic except for special traffic requests.

Table 3.9-5. Possible Construction Traffic Travel Routes

Route	Access Control Point	Distance[a] (miles)	Travel Time[b] (minutes)
1	Main Gate	1.75	4.20
2	Trainor Gate	1.68	4.03
3	Badger Gate	2.50	6.00
4	Richardson Gate[c]	1.31	3.14

Notes:

a. Distance from the ACP to proposed CHPP site.

b. Travel times were estimated for a 25-mph posted speed and do not consider traffic-related delays.

c. Richardson Gate is closed to all traffic and is only opened for special traffic requests.

Temporary impacts on traffic flow would occur as part of the construction and demolition processes for Alternative 1. Possibility of increased traffic congestion as a result of construction-related traffic would be highest during peak travel times from 7:00 a.m. to 8:00 a.m. and from 4:30 p.m. to 5:30 p.m. All construction traffic would be localized to the CHPP site and utilidor renovation areas. Additionally, construction Route 1 uses two intersections that were identified to have an LOS F: Gaffney Road and 599th Street, and Gaffney Road and 10th Street. Additional vehicles at these intersections have the potential to increase traffic volume and congestion. The level of impact would depend on the construction vehicle routes, frequency of travel, peak times for construction vehicle activity, and length of the construction period. Most construction workers would park on the site during construction activities, and the vehicles would use the ACPs outside of peak hours if practicable, which would limit adverse impacts. Temporary impacts on transportation and traffic as a result of utilidor renovations depends on location, duration, and proximity to roadways and rail lines. If utilidor renovations occur in or adjacent to roadways, there could be impacts from to the presence of construction traffic and the possibility of partial road closure.

The anticipated increase in traffic to and from the installation and on installation roadways from construction worker commutes, construction vehicle travel, hauling of construction and demolition debris, and delivery of construction materials is not expected to adversely affect off-installation local and regional roadways and rail lines because the increase in traffic compared to existing traffic volumes would be negligible. In the case of construction near transportation infrastructure or renovation of utilidor segments that cross a throughway, the regular flow of traffic would be maintained to the greatest extent possible and degradation of roadways and rail lines would be avoided. Fort Wainwright would minimize interference with non-construction traffic on roads selected for hauling materials to and from the CHPP site and would provide any and all BMPs, including flaggers, notifications, and temporary detours to reduce any short-term impacts that may occur.

Long-term adverse impacts as a result of Alternative 1 would not be anticipated. Following the completion of construction and demolition activities, the newly constructed coal-fired CHPP would not generate additional traffic volumes that would decrease the LOS on roadways within Fort Wainwright. Coal would continue to be delivered via rail from a local coal mine in Healy, and no additional freight deliveries by rail would be anticipated to support the new coal-fired CHPP operation; therefore, no reduction in traffic flow would occur.

3.9.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Alternative 2 would not include construction or modification of any roads or transportation networks. Impacts that may occur from the Proposed Action would primarily be a result of increased traffic volume and not a result of roadway construction or reconfiguration.

Short-term, minor, adverse impacts, and long-term, negligible to minor, adverse impacts on transportation and traffic systems at Fort Wainwright would be expected as a result of Alternative 2. Temporary impacts on traffic would occur during the construction and demolition period for the existing coal-fired CHPP and proposed dual-fuel CHPP; during construction for the natural gas pipeline; and during renovation of the utilidor system. Long-term impacts would occur from delivery of natural gas and ULSD.

Short-term impacts from construction and demolition activities would be identical to those discussed for Alternative 1. Additionally, as described for Alternative 1, construction vehicle traffic would use the four general transportation routes identified in Figure 3.9-3. Travel distances and times for each route are included in Table 3.9-5.

Long-term, negligible to minor, adverse impacts on regional transportation as a result of Alternative 2 would occur following the completion of the new dual-fuel CHPP. Operation of the new plant would require delivery of LNG by truck to a 5.25-million-gallon tank in Fairbanks managed by a gas provider, which would result in long-term, minor impacts on traffic volumes in and around the city of Fairbanks, particularly near the gas provider facility (IGU 2019). LNG would then be re-gasified in Fairbanks and delivered to Fort Wainwright via gas pipeline, which would have negligible long-term effects on transportation and traffic. ULSD, the secondary fuel source, would be delivered periodically to Fort Wainwright by truck. The transportation routes for delivery vehicles would be analogous to those used for construction traffic, with Route 1 and utilization of the Main Gate being the preferred route. Long-term, minor impacts related to traffic flow could occur because of an increase in delivery vehicles at ACPs, contributing to congestion; and would depend on the fuel delivery schedule, frequency of deliveries, and delivery route. Trucks would no longer be used to transport coal ash from the CHPP to the landfill at Fort Wainwright, however. Delivery of coal by rail would no longer be needed at the new CHPP, which would cause a decrease in rail traffic. The current number of weekly freight deliveries by rail would decrease 16 percent from 25 to 21 deliveries, a difference that may have a negligible to minor benefit for road traffic at Fort Wainwright because temporary traffic flow stops at railroad crossings would occur less frequently. Over the long-term, however, LNG shipments to Fairbanks could occur by rail, which would increase rail deliveries. The deliveries under this scenario could likely increase rail traffic into Fairbanks back to current conditions, resulting in negligible or lower impacts.

3.9.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Alternative 3 would not include construction or modification of any roads or transportation networks. Impacts that may occur from the Proposed Action would primarily be a result of increased traffic volume and not a result of roadway construction or reconfiguration.

Short-term, minor, adverse impacts and long-term, minor to moderate, adverse impacts on transportation and traffic systems at Fort Wainwright would be expected as a result of Alternative 3. Temporary impacts on traffic would occur during the construction period for the new natural gas boilers and natural gas pipeline; renovation of the steam distribution system; and demolition of the existing coal-fired CHPP.

Because the installation of multiple high-efficiency natural gas boilers would be dispersed at facilities across the installation, construction transportation routes would vary. It is assumed that all incoming and outgoing construction vehicles would use all four ACPs to access the proposed construction sites.

Short-term impacts from construction and demolition activities would be identical to those discussed for Alternative 1. Additionally, vehicle transportation related to demolition activities at the existing coal-fired CHPP would use the four general transportation routes described for Alternative 1 and identified in Figure 3.9-3. Travel distances and times for each route are included in Table 3.9-5. Long-term, negligible to minor, adverse impacts on transportation and traffic systems at Fort Wainwright are anticipated to occur as a result of continued natural gas and ULSD supply operations. These impacts would be identical to those discussed for Alternative 2.

3.10 Human Health and Safety

The ROI for human health and safety for the proposed project is the Main Cantonment Area, including utility corridors served by heat or electricity from the existing CHPP.

3.10.1 Affected Environment

3.10.1.1 Definition of Resource

Human health and safety considers those facets of military activities and materials that potentially pose a risk to the health, safety, and well-being of the public, military personnel, civilian employees, and dependents. Aspects of military activities and construction activities that can present risk to human health and safety include vehicle operation, occupational and construction safety hazards, and handling and management of hazardous materials and hazardous waste.

3.10.1.2 Environmental Laws, Regulations, and Executive Orders

USAG Alaska has implemented a comprehensive program to eliminate, avoid, or reduce the associated risks to its workers and the public (USAG Fort Wainwright 2019). USAG Alaska's health and safety program operates in compliance with the following regulations and guidance documents:

- Occupational Safety and Health Act of 1970 (29 U.S.C. §§ 651-678) and implementing regulations at 29 CFR Part 1910, Occupational Safety and Health Standards, and 29 CFR Part 1926, Safety and Health Regulations for Construction)
- AR 40-5, Preventive Medicine
- AR 75-15, Policy for Explosive Ordnance Disposal
- AR 200-1, Environmental Protection and Enhancement
- AR 385-10, Safety Program
- AR 385-64, Army Explosives Safety Program
- *Risk Management*, Army Training Publication ATP 5-19 (Army 2014)
- Hearing Conservation Program, Pamphlet 40-501 (Army 2015b)
- The Army Industrial Hygiene Program, Pamphlet 40-503 (Army 2013)
- DoD Directive 4715.11, Environmental and Explosives Safety Management on DoD Active and Inactive Ranges within the United States
- DoD Directive 6055.9–STD, DoD Ammunition and Explosives Safety Standards

These regulations and guidance documents have directed the development of SOPs, which all installation users are required to follow.

3.10.1.3 Current Condition

Health

The Fort Wainwright Main Cantonment Area supports military training missions, airfield operations, and industrial and commercial land uses, as well as residential communities. As such, it contains the same range of human health and public health issues of any developed community, including livelihood, human health issues, and safety and injury issues. One key military mission based at Fort Wainwright is the Medical Department Activity – Alaska (MEDDAC – AK), which operates Bassett Army Community Hospital. MEDDAC – AK, through the hospital and outlying clinics, serves all Army personnel in Alaska plus Fairbanks-area Air Force beneficiaries, Army family members, and retirees from all branches of service. The hospital is located on Neely Road 0.4 mile northwest of the existing CHPP. Kamish Soldier Centered Medical Home, about 0.6 mile southeast from the CHPP, provides primary care for Soldiers and their dependents. Both facilities depend on the CHPP for heat and for standard electrical power needs.

Within 0.5 mile of the CHPP are housing units and garden plots to the west, and ballfields, a post office, a fitness center, and commercial outlets to the east. Such indoor and outdoor public use areas are receptors for emissions generated at the CHPP.

The storage and handling of fuels and combustion byproducts are a potential health and safety risk. Releases of coal dust from transporting coal trains through the western portion of the Main Post, unloading train cars, storing coal, and transferring coal to the CHPP for burning are controlled through enclosed handling systems at the CHPP, including conveyers, ventilation, and air filtration, to protect public health. Coal ash and similar byproducts of coal combustion are collected in silos and loaded into trucks in an enclosed area for transport to the Fort Wainwright landfill. Coal ash contains metals, such as arsenic, that can be toxic if sufficiently concentrated and ingested or inhaled. These metals can have adverse effects on human health, such as increased cancer risk and nervous system impacts and other problems from lung disease to birth defects (Physicians for Social Responsibility [PSR] 2010a). CHPP coal ash has been disposed of two to three times per week for many years in the unlined Fort Wainwright landfill, and no known contamination issues have been identified from coal ash disposal (USACE 2019). Disposal of ash in other unlined facilities in the United States has led to contamination of groundwater in some cases (PSR 2010b). The landfill is operating in accordance with the state-issued solid waste disposal permit. A closed portion of the landfill has known contamination, and groundwater monitoring wells are in place to ensure there are no human health impacts.

Fairbanks in general does not meet all air quality standards. Fairbanks, including Fort Wainwright, is within a nonattainment area for $PM_{2.5}$, which can cause respiratory and heart health problems (Dellinger et al. 2008). The emissions from coal combustion contribute to the $PM_{2.5}$ load in the nonattainment area. See Section 3.2, Air Quality, for details.

Fort Wainwright in general, including the Main Cantonment Area where people live and work, is classified as a Superfund site for hazardous wastes in soils (USAG Fort Wainwright 2017a). Exposure to such wastes is a recognized health hazard. Fort Wainwright waste management sites are operated to avoid exposure by the general public and, when needed, to ensure work in such areas is done to minimize health hazards to workers, in compliance with OSHA and military directives. See Section 3.4, Hazardous and Toxic Materials and Wastes, for further information. The landfill at Fort Wainwright is a Class I municipal solid waste landfill that is permitted by ADEC to accept municipal solid waste on a case-by-case basis and routinely accepts inert waste and coal ash from the CHPP.

In addition, Fort Wainwright has residual amounts of ACMs, LBP, and PCBs in older buildings and in construction and industrial materials and equipment. ACM that become friable or easily dry and then are susceptible to crumbling and releasing airborne fibers were banned in 1991; LBP was banned in 1978; and PCBs are required to be in an enclosed system because of adverse health effects of these substances. ACM occurs as heat-proof insulation and possibly as sound proofing in the CHPP and utilidors. LBP could occur in any paint applied before 1978 and is likely present in the CHPP. PCBs may occur in light fixtures but are not known to occur in electrical transformers.

Safety

The USAG Alaska's program to eliminate, avoid, or reduce safety risks for its workers and the public includes the following basic components:

- Complying with all applicable federal and state laws and regulations addressing health, safety, and risk management
- Developing local regulations and detailed SOPs, which further implement these laws and regulations and focus on unique risk factors and mission requirements within lands of Fort Wainwright
- Establishing a local installation safety office that has the proper resources and authority to effectively implement the USAG Alaska's health and safety program and that is properly integrated with other USAG Alaska and local civilian safety and emergency response organizations
- Providing effective, mission-focused training and guidance to all USAG Alaska personnel
- Encouraging proactive employee participation in safety and health programs and charging leaders at all levels with the responsibility for planning and conducting mission activities in a safe manner (USAG Fort Wainwright 2019)

The storage and handling of fuels is a potential health and safety risk. The 2018 coal dust fire at the CHPP, discussed in Section 1.1.2, is indicative of one type of risk. Fort Wainwright also transports, stores, and handles large quantities of automobile and aircraft fuel and ordnance that presents an explosion and fire risk. Contact with some toxic materials also can cause injury or illness.

The area around the existing CHPP is a designated Safety Danger Zone.

3.10.2 Environmental Consequences

3.10.2.1 Significance Criteria

A significant adverse impact on human health and safety would result if an Army action were to result in either of the following:

- Violate applicable regulations and policies designed to protect human health and safety
- Be anticipated to have a substantial risk of causing imminent or chronic human health and safety problems

3.10.2.2 No Action Alternative

The No Action Alternative could have moderate to significant adverse impacts on mental and physical human health, because it would continue to rely on aging infrastructure and not reduce the risk of loss of heat and power on the installation. Heat and power loss in the winter could result in extended periods of below zero temperatures that not only present a risk to the human body but can rupture pipes and damage infrastructure that people depend on for day-to-day living. To prevent physical health problems associated with loss of heat and power in a subarctic environment, it is likely Fort Wainwright would be evacuated on short notice under such a scenario. Base evacuations, especially during the winter, pose a health and safety risk to the Fort Wainwright population and workforce, including people with adverse health conditions and patients at the hospital. Such evacuations could have moderate, stress-related adverse impacts on mental health by disrupting work and family routines and military mission. Although the scenario is not highly likely to occur, the CHPP and utilidor infrastructure is well beyond its expected life and has presented failures to the extent that the potential is no longer considered a reasonable risk.

To continue operating the existing plant and comply with regulatory standards, USAG Alaska would need to repair and upgrade plant parts and technologies, upgrade approximately 27 miles of aging pipelines within the utilidors, incorporate substantial BACTs, and continue operating the CHPP at reduced capacity. This work would be completed under SOPs designed to protect human health and safety. Despite health and safety regulations, such construction and maintenance would include risks to workers and the general public. The utilidors contain asbestos that likely would require at least partial abatement to renovate the utilidors. Workers could be exposed to asbestos and other hazardous materials during renovation; however, following all applicable rules and SOPs for these hazards would substantially minimize risks.

3.10.2.3 Alternative 1 (Build a New Coal CHPP)

Long-term, minor to moderate, adverse and beneficial impacts on health and safety would occur under Alternative 1. This alternative would substantially reduce the risk of heat and power loss and the resulting base evacuation, and would substantially reduce the health and safety risks of such an evacuation in winter to the Fort Wainwright population and workforce, including patients at the hospital. Alternative 1 would have a long-term beneficial impact on human health and safety by providing greater reliability against loss of heat and power.

All construction would be conducted in accordance with relevant regulations established by USAG Alaska, OSHA, and other federal and state agencies. Construction sites would be accessible only to workers and authorized personnel, which would minimize risks to workers and passers-by. Design and construction of new habitable facilities at Fort Wainwright would comply with requirements set forth in Unified Facilities Criteria (UFC) 4-010-01, DoD Minimum Antiterrorism Standards for Buildings (DoD 2018c). Temporary health and safety risks from construction of Alternative 1 would be managed through adherence to applicable OSHA regulations and Governmental Safety Requirements

(DoD 2019a). Alternative 1 would retain coal as the primary fuel, and modern technology for minimizing emissions would be expected to reduce emissions that contribute to health problems, compared to existing conditions and the No Action alternative (see Section 3.2, Air Quality). Alternative 1 would be expected to meet air quality standards without having to reduce the heating capacity of the plant. Coal ash would continue to be generated, loaded, transported, and disposed of at the Class I municipal solid waste landfill located on Fort Wainwright. If the on-post landfill were to reach capacity in the near future, the landfill would be closed and covered, and coal ash would then be disposed of at another location such as an approved landfill in Fairbanks. Alternative 1 would employ the same coal ash handling and disposal process currently used under existing operations. The Army would continue to monitor groundwater quality to minimize the potential for human health impacts. Because of greater efficiency of the new CHPP, less ash would be anticipated to be produced than at the existing CHPP , which would extend landfill capacity.

3.10.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Alternative 2 would retain the concept of a central heating and power plant but change the fuel from coal to natural gas and/or ULSD fuel. It is anticipated that the new plant would meet all air quality standards. Because natural gas facilities have lower emissions than even state-of-the-art coal-fired facilities, air emissions would be expected to be lower than those under Alternative 1 or the No Action Alternative. See Section 3.2, Air Quality.

In general, health and safety benefits of removing the existing CHPP would be the same as those discussed for Alternative 1. Most adverse impacts also would be the same as discussed for Alternative 1. With implementation of SOPs, the impacts are expected to be minor. Alternative 2 would avoid health risks associated with loading, transport, and disposal of coal ash indicated under Alternative 1.

Alternative 2 would involve running a new natural gas pipeline from a commercial LNG storage and distribution system in Fairbanks to Fort Wainwright and the location of the new CHPP. It also would involve new storage tanks for a minimum of a 14-day supply of ULSD fuel at the installation. Such tanks, which are expected to have a total volume of tens of thousands of gallons, would be required to have containment and/or double-wall construction to prevent and contain spills to the natural environment. The tanks would be located adjacent to the CHPP and would be vented. The installation of new natural gas pipelines and utility piping systems associated with the new CHPP would follow all applicable national and local building codes, which would minimize the risk of gas system explosions and fires that could otherwise pose a risk to human health and safety at the CHPP and nearby structures. BMPs would minimize odor or health issues in nearby public use areas (the hospital and homes are located within about 1,500 feet; baseball diamonds within about 2,000 feet).

3.10.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Alternative 3 would remove the concept of a CHPP, replacing it with a large number of individual smaller boilers at individual facilities. These boilers would be designed to run normally on natural gas and would use a combination of steam and heated glycol/water for heat. In the event of a power outage or natural gas interruption to mission-critical buildings, ULSD-reciprocating internal combustion generators would be used as emergency backup power or heat sources for boilers. Coal would no longer be imported to Fort Wainwright.

In general, health and safety benefits would be the same as those discussed above for Alternative 1. It is anticipated that the new boilers would meet all air quality standards. Because natural gas facilities generate fewer emissions than even state-of-the-art coal-fired facilities, air emissions would be expected to be cleaner than those under Alternative 1. See Section 3.2, Air Quality.

Most adverse effects also would be the same as discussed under Alternative 1. With implementation of SOPs, the impacts are expected to be minor. Alternative 3 would avoid health risks associated with loading, transport, and disposal of coal ash that was indicated under Alternative 1.

Alternative 3 would involve running a new gas main from a commercial LNG storage and distribution system in Fairbanks to Fort Wainwright, and a new gas distribution system throughout the Main Cantonment Area. The existing CHPP likely would be demolished, and the coal storage and handling facilities would be removed.

Because multiple buildings are considered mission critical for military missions, the distributed gas boilers at many buildings would be dual-fuel boilers and would have their own dedicated fuel tanks. Additionally, a back-up power supply would be provided by generators and a 14-day supply of ULSD fuel would be located within the installation boundary on Fort Wainwright.

3.11 Geology and Soil Resources

3.11.1 Affected Environment

The ROI for geology and soil resources is the Fort Wainwright Main Cantonment Area, with further focus on the existing utilidors, the existing coal storage area, and the area at and west of the existing CHPP, which is the area for any planned new central heating and power plant.

3.11.1.1 Definition of Resource

Geology and soil resources include the surface and subsurface materials of the earth. Within a given physiographic province, these resources typically are described in terms of topography, soils, geology, minerals, and paleontology, where applicable.

Regional topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information describing topography typically encompasses surface elevations, slope, and physiographic features (i.e., mountains, ravines, and depressions).

Site-specific geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are the seismic conditions (i.e., potential for subsurface shifting, faulting, or crustal disturbance), topography, and soil stability. Soils are the unconsolidated materials overlying bedrock or other parent material. They develop from weathering processes on mineral and organic materials and are typically described in terms of their landscape position, slope, and physical and chemical characteristics. Soil types differ in structure, elasticity, strength, shrink-swell potential, drainage characteristics, and erosion potential, which can affect their ability to support certain applications or uses. In appropriate cases, soil properties must be examined for compatibility with particular construction activities or types of land use.

3.11.1.2 Environmental Laws, Regulations, and Executive Orders

The primary rules affecting soils are related to the Farmland Protection Policy Act (FPPA) of 1981, and its implementing regulations, 7 CFR Part 658. Prime and unique farmland is protected under the FPPA. The intent of the FPPA is to minimize the extent that federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. There are no prime or unique farmlands in the Main Cantonment Area. No other laws or regulations concerning geology and soils have been identified that are relevant to the proposed project.

3.11.1.3 Current Condition

The developed area of Fort Wainwright is bounded roughly on the north by the Chena River and on the south by the Tanana River. The Main Cantonment Area is chiefly a flat lowland area at about 400 feet elevation between these rivers. Consequently, the primary surficial geology is floodplain alluvium and is mapped as 1 to 20 feet of alluvial silt (Pewe et al. 1966).

Minerals management goals and objectives from the *Integrated Natural Resource Management Plan: USAG Fort Wainwright*; USAG Fort Wainwright 2013b, p. B-42) are listed below:

- Manage the mineral resources on Fort Wainwright lands in the best interest of the public within the framework of the military mission
- Provide the military with a source of saleable construction materials for military construction purposes

Bedrock Geology

Bedrock is generally not present at the surface in the Fort Wainwright Main Cantonment Area. Across the Chena River, east of Ladd AAF, relatively small outcrops of intrusive rocks and still smaller outcrops of Birch Creek schist are found. Farther north are similar small outcrops of Birch Creek schist and areas of extrusive igneous rocks (basalt) at the surface (Pewe et al. 1966).

Seismicity

Earthquakes present a risk of damage to structures in most of Alaska. The Alaska *State Hazard Mitigation Plan* (Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management [DHSEM] 2018) notes that damaging earthquakes can affect the Fairbanks area. An example is the 7.9 magnitude Denali Earthquake of November 3, 2002, which was centered 84 miles south of Fairbanks and lasted for 3 minutes (Denali National Park 2019). The *State Hazard Mitigation Plan* quotes the Alaska Earthquake Center of the University of Alaska, indicating that three earthquakes with a magnitude greater than 7 magnitude have occurred within 50 miles of Fairbanks since the early 1900s.

Earthquake hazard is typically described in terms of peak ground acceleration (pga), which is expressed as a percentage of the acceleration due to gravity (percent g). The *State Hazard Mitigation Plan* indicates that in Fairbanks, the pga that has a 2 percent chance of being exceeded in 50 years (or 0.04 percent chance in any given year) is 34 to 53 percent g. This pga corresponds to shaking that is perceived as very strong to severe, and may cause moderate to moderate/heavy damage. Smaller (i.e., lower magnitude) earthquakes have less severe ground shaking and are more common, whereas higher magnitude earthquakes have more severe earth shaking and are uncommon. Although strong earthquakes may not occur often in the Fairbanks area, they pose a risk of moderate to heavy damage.

The *State Hazard Mitigation Plan* categorizes major earthquake hazards as follows (DHSEM 2018):

- Strong ground motion
- Surface rupture
- Subsidence and uplift
- Earthquake-related ground failure
- Seiche (waves or “slosh” in a confined waterbody)
- Tsunami (ocean wave)

Seiche and tsunami do not pose a risk at Fort Wainwright. The other earthquake hazards, however, may be applicable in the Fort Wainwright area and can lead to structure damage. Ground failure includes landslides and a process called liquefaction, in which saturated soils lose their structure and behave like a liquid. Liquefaction can lead to lateral spreading, which is the lateral movement of ground on and within a zone of liquefied soil. Soils most prone to liquefaction are poorly graded (i.e., have a uniform grain size) and non-cohesive (e.g., sands).

Economically Viable Minerals

Federal lands were withdrawn from general purposes for USAG Alaska lands and therefore are not open to the staking of hard rock or placer mining claims and are not open for mineral leasing (such as oil and gas leasing). Saleable materials, such as gravel for construction, have not been made commercially available since the lands were withdrawn for military purposes in the 1950s.

Fuels proposed for use to generate heat and electrical power at Fort Wainwright are fossil resources. ULSD and natural gas, which are considered as potential fuels for the proposed project, are refined products that can be purchased through distributors. ULSD in Alaska comes partly from a refinery in Kenai, which refines North Slope crude oil, and partly from refineries outside the state. Natural gas is produced and sold commercially from Cook Inlet near Anchorage. Gas produced on the North Slope is re-injected into the ground to maintain pressure as an aid in extracting oil. No gas pipeline connects the North Slope gas to markets. Coal used currently at Fort Wainwright comes from a local coal provider located in Healy, about 125 road or rail miles southwest of Fort Wainwright. According to the mine's website, the mine has operated since 1943, produces 1.2 million to 2.0 million tons of coal per year, and serves six Interior Alaska power plants (Usibelli Coal Mine 2019). It produces subbituminous coal from a coal lease area of approximately 35,000 acres and has total surface reserves of approximately 450 million tons. It is the only operating coal mine in the state.

Soil Series and Properties

Greater Fairbanks is considered an area of discontinuous permafrost (perennially frozen soils). Permafrost occurs in multiple soil types at depths ranging from less than 1.6 feet to 66 feet to the upper surface of the perennially frozen area, and occurs to depths of about 165 feet. Thawed areas are deepest beneath swales and former stream channels and beneath constructed areas, such as roads, pipelines, buildings, and areas cleared of vegetation. The soil pattern can be complex, with frozen and non-frozen areas intermixed and groundwater both above and below frozen soils. Southward sloping sediments and bedrock, such as at Birch Hill north of the study area, are generally not permanently frozen (Lawson et al. 1998).

As reported in soil survey data from the Natural Resources Conservation Service (NRCS), an 8,000-acre rectangle consisting mostly of the Main Cantonment Area[1] includes 25 soil

[1] A soils map of the general study area was produced from the NRCS online mapping tool. The mapped area extended from the northernmost bends of the Chena River to the firing ranges south of the Richardson Highway and from the Main Post gate area on the west side of Fort Wainwright to the Badger Road area east of the installation. This rectangular area encompasses nearly 8,000 acres.

map units. The developed cantonment area primarily consists of four soil map units (NRCS 2019):

1. **Urban land.** This classification appears almost everywhere that has been developed with streets, the airfield, buildings, and utilities, including the area of the existing CHPP and coal mound and the areas north and east of the CHPP.
2. **Salchaket-Typic Cryorthents complex.** This unit consists of alluvium (silt, sand, and gravel deposits from water). These soils occur in the central developed area south of the airfield (and more than 1,200 feet east of the CHPP) and have been built upon. A large band of these soils also occurs immediately south of the coal mound and its adjacent pond as well as east and west of the coal mound. Some of these soils have been developed for housing (west of the coal mound) and ballfields (east of the coal mound).
3. **Tanana mucky silt loam.** These soils consist of alluvium and/or loess (deposits from wind) over alluvium in terraces. Soils with this classification occur south of the CHPP beyond the band of soil unit No. 2 above and in other mostly small pockets.
4. **Mosquito mucky peat.** This unit consists of organic material over alluvium and is found in depressions where ponding is frequent. Soils with this classification occur south of the CHPP beyond the band of soil unit No. 2 above and in other medium-sized pockets.

These soils are generally flat, with slopes of 1 to 2 percent and small areas with slopes of 5 to 15 percent. The flooding frequency classification for the non-urban soils is “rare”; urban land soils are not rated for flooding. Table 3.11-1 lists some properties relevant to construction for these soils.

Table 3.11-1. Selected Soil Properties

Property	Urban land	Salchaket-Typic Cryorthents Complex	Tanana Mucky Silt Loam	Mosquito Mucky Peat
Drainage class	Not classified	Well drained	Poorly drained	Very poorly drained
Frost action	Not rated	Moderate	High	High
Percent silt	Not rated	18.4%	35.4%	30%
Percent clay	Not rated	5.5%	7.5%	5%
Depth to permafrost	Not rated	>6 feet 7 inches	2 feet 1 inch	2 feet
Depth to bedrock	>6 feet 7 inches	>6 feet 7 inches	>6 feet 7 inches	>6 feet 7 inches
Erosion factor	Not rated	0.43	0.43	0.37

Shaking of saturated soils prone to liquefaction (see Section 3.11.1.3) may cause loss of load-bearing capacity, settlement, and damage to infrastructure.

An Alaska Division of Geological & Geophysical Surveys report on the potential for earthquake-induced liquefaction in the Fairbanks area (Combellick 1984) states:

> A preliminary determination of liquefaction susceptibilities of deposits in the area … indicates that saturated sediments in and near the active river channels of the Tanana, Chena, and Nenana River flood plains are highly likely to liquefy during strong shaking. The liquefaction susceptibility of Holocene abandoned flood-plain deposits ranges from moderate to high, depending on the relative quantity of gravel.

The report maps the Main Cantonment Area primarily as having moderate liquefaction susceptibility, with pockets of low susceptibility and narrow bands of very high susceptibility along rivers.

Soil Erosion Potential

According to the NRCS, Erosion Factor (K) indicates the susceptibility of a soil to sheet and rill erosion by water. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Overall values of K range from 0.02 to 0.69. The NRCS ratings for soils in the study area indicate an intermediate susceptibility to erosion (see Table 3.11-1).

Some urban land likely consists partly of reworked and compacted local soils and partly of imported compacted foundation materials. Additionally, some may be reworked but uncompacted local soils. In general, uncompacted reworked soils are likely to be more susceptible to erosion.

3.11.2 Environmental Consequences

3.11.2.1 Significance Criteria

A significant impact on geology and soil resources could result if the Army action were to result in any of the following:

- Violate best engineering practices and policies designed to maintain soils and permafrost and prevent erosion
- Cause substantial problems for soils as a stable foundation for buildings and utilities or as a resource for plant growth and aesthetics
- Result in unacceptable risk of soil loss to the air (wind) or water, subsidence, or failure
- Induce dust in violation of air quality standards or increase turbidity over natural levels in waterbodies as a result of water erosion and runoff that would violate water quality standards

3.11.2.2 No Action Alternative

The No Action Alternative would not result in any substantive impacts on geology and soils. Maintenance work on the existing CHPP, utilidors, and other heat and power utility systems would occur and could include excavation and work in site soils, but these work activities would be similar to any ongoing maintenance that occurs today or that would occur under any alternative and would principally be in soils already disturbed for construction in the past. The risk of damage from an earthquake would be relatively high because of the aged infrastructure and the centralized nature of the existing system. Earthquake damage to the CHPP could affect all heated and powered buildings on Fort Wainwright, even if most buildings were otherwise not damaged.

3.11.2.3 Alternative 1 (Build a New Coal CHPP)

Alternative 1 would have short-term, negligible to minor, adverse impacts on geology and soils. Soils in the vicinity and within the footprint of the proposed new CHPP under Alternative 1 have been previously disturbed for construction. Any new impacts on soils likely would be limited. Impacts from potential disturbance of contaminated soils during demolition and construction activities are addressed under Section 3.4, Hazardous and Toxic Materials and Waste.

In general, some alluvial soil types at Fort Wainwright could be less than ideal as foundation material for new facilities. Soils may exhibit characteristics that could put the new heat and power facilities at risk, including risks from earthquake and soil liquefaction. Even previously disturbed, engineered, or compacted soils used in construction would be subject to seismic risk. Some soils could be considered susceptible to erosion, primarily during construction activities. If pockets of permafrost were physically disturbed or if their thermal regimes were changed by construction, thawing permafrost could lead to soil and foundation instability. Standard design and engineering practices would include a soils analysis of the areas to be built upon and best-practice engineering to ensure minimum risk to the constructed facilities. With a central heating system, Alternative 1 would pose somewhat greater risk of a heat outage across Fort Wainwright from earthquake damage than for a dispersed system, because damage to a single site could affect all heated buildings.

Coal would be the source of heat and power generation under Alternative 1. Theoretically, Fort Wainwright could purchase coal in an open market from anywhere. As a practical matter, the only producing coal mine in Alaska is relatively nearby in Healy. The mine has reserves to last the life of the proposed new CHPP.

Impacts on soils, including sedimentation and erosion, would be reduced to negligible by implementing BMPs and SOPs. An erosion and sediment control plan would be developed before construction to help minimize soil erosion. Earthquake risk would be mitigated by following standard engineering practices in evaluating foundation soils and incorporating seismic design. Adherence to these practices would not remove the risk of damage to structures but would minimize the risk to acceptable levels.

3.11.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Alternative 2 and its relationship to site soils would be similar to that for Alternative 1. With a central heating system, Alternative 2 would also present somewhat greater risk of a heat outage across Fort Wainwright from earthquake damage than for a dispersed system. In addition, the single supply line for natural gas could be at risk of rupture in a large earthquake and could result in heat loss fired by gas. This alternative would include a backup diesel fuel source at the new CHPP.

Natural gas would be provided by a natural gas distribution system in Fairbanks to Fort Wainwright, and a new gas distribution system throughout the Main Cantonment Area. Potential short-term impacts could occur from soil disturbance during pipeline construction.

Natural gas and ULSD fuel would be the source of heat and power generation under Alternative 2. Fort Wainwright would purchase these fuels in an open market, and the fuels could come from Alaska reserves or could be imported to Alaska from refineries in other states. The source could change over time.

Impacts would be reduced by using the same SOPs and BMPs identified under Alternative 1.

3.11.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Alternative 3 and its relationship to site soils would be similar to that for Alternative 1. The decentralized nature of Alternative 3 would not involve construction of a large, new central facility near the existing CHPP. Instead, boilers likely would be housed within existing structures; new additions to existing structures; or new, smaller, and dispersed heating-plant buildings that would heat a handful of nearby buildings. This alternative would serve to disperse the risk of heat outage across the Fort Wainwright Main Cantonment Area that could occur from earthquake damage to a central heating plant. Instead, individual buildings could be without heat following an earthquake, while others would be likely to continue operating. The single supply line for natural gas could be at risk of rupture in a large earthquake and could result in loss of heat fired by gas. This alternative would include backup heating systems with their own fuel supplies.

Natural gas would be the source of heat under Alternative 3. Fort Wainwright would purchase natural gas and electricity in an open market, and the gas could come from Alaska reserves or could be imported to Alaska from refineries in other states. The source of gas could change over time. Mitigation would be the same as described under Alternative 1.

3.12 Water Resources

3.12.1 Affected Environment

The water resources described in this section includes surface water features (e.g., lakes, streams, rivers), groundwater, floodplains, and storm water specific to the Fort Wainwright area. The ROI for water resources is the Fort Wainwright Main Cantonment Area. The subsections below focus on water resources in the Fort Wainwright Main Post and Main Cantonment Area, but in some cases, descriptions extend to areas beyond the Main Post to provide additional context.

3.12.1.1 Definition of Resource

Surface Water

Surface waters include rivers and streams (i.e., flowing waters), lakes, reservoirs, ponds, and wetlands. The USACE defines wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR § 328.3[b]). Surface water supplies the majority of Alaska's combined water needs for industry, agriculture, mining, fish processing, and public water use (Alaska Department of Natural Resources [ADNR] 2019. Surface waters and their ecosystems support plant and wildlife species, including Pacific salmon, and are important to the economic, recreational, and human health of a community or locale (DoD 2009).

Groundwater

The term “groundwater” refers to water below the ground’s surface that is contained in the spaces and cracks of rocks and/or unconsolidated materials, such as sand or gravel. Surface water and groundwater are intimately linked to one another within the hydrologic cycle. Groundwater aquifers are replenished by rain and snowmelt that seep down into the ground and infiltrate cracks and crevices of soils and/or rocks below ground. Groundwater typically moves relatively slowly and may eventually recharge surface water, such as streams and lakes. Groundwater is often described in terms of depth from the ground surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations (DoD 2009).

Groundwater is an essential natural resource used for drinking, irrigation, recreation, and industrial purposes. Groundwater helps to regulate atmospheric, hydrological, and nutrient cycles and serves other ecologically important roles. Organisms in groundwater help clean up contaminants and may play an important role in maintaining the health of surface waters (U.S. Forest Service [USFS] 2019). Groundwater resources are used for most domestic needs throughout Alaska and for bottled water export, and support many industrial operations (ADNR 2019a).

Floodplains

Floodplains are areas of low-lying ground adjacent to rivers or stream channels, formed mainly of river sediments that may normally be dry but become inundated with water during flood events. A floodplain extends from the edges of a stream or riverbank to the outer edges of a valley, providing a broad area to disperse and temporarily store floodwaters. Floodplains are dynamic ecosystems that perform several functions critical to the ecology of a stream or river (Federal Emergency Management Agency [FEMA] et al. 2002). Floodplains naturally convey and store flood waters and moderate floods by reducing flood peaks, peak velocities, and the potential for erosion. Floodplains recharge groundwater, cycle nutrients, maintain and improve water quality, and support plant and animal biodiversity.

Flooding can result from snowmelt in years with high snowfall and accumulation of snow water equivalent in the catchment in late spring, ice jams during breakup, or excessive rainfall during summer. Local topography, the frequency of precipitation events, and the size of the watershed above the floodplain influence the risk of flood potential. FEMA is responsible for determining flood elevations and floodplain boundaries to evaluate flood potential.

Storm Water

Fort Wainwright's storm sewer system conveys storm water runoff throughout the installation and is regulated as a Municipal Separate Storm Sewer System (MS4) under ADEC Permit AKS055859 (ADEC 2016). Storm water discharges are generated by runoff from land and impervious areas (e.g., paved streets, parking lots, and rooftops) immediately during and after rainfall and snowmelt events. Storm water discharges often contain pollutants in quantities that could adversely affect water quality. As storm water flows over land and impervious surfaces, it accumulates debris, sediment, chemicals, and other pollutants that could adversely affect water quality if untreated. Storm water runoff can be a pollution source for surface waters. Most storm water discharges are considered point sources and require coverage under a National Pollutant Discharge Elimination System permit, which in Alaska is now referred to as the Alaska Pollutant Discharge Elimination System (APDES) permit.

In Alaska, the Bureau of the Census recognizes Fairbanks as an urbanized area. As such, the Army was required to obtain an MS4 permit and operate under a Storm Water Management Plan (SWMP). ADEC issued Permit AKS055859 for Fort Wainwright in September 2016 (ADEC 2016). The Army developed an SWMP for Fort Wainwright to satisfy MS4 permit requirements in December 2016 (Center for Environmental Management of Military Lands [CEMML] 2016). Storm water discharges covered by other permits, including industrial activities covered under the Multi-Sector General Permit (MSGP) or construction activities addressed under ADEC's Alaska Construction General Permit, are also required to comply with the installation's MS4 Permit. Storm water discharges for MSGP activity at the existing CHPP are permitted under an MSGP permit (Permit AKR06AE33) issued to the CHPP's System Owner in August 2016 by ADEC (CEMML 2016).

3.12.1.2 Environmental Laws, Regulations, and Executive Orders

The CWA establishes the basic structure for protecting waters of the United States and regulating quality standards for surface and groundwater. The CWA requires that each state develop a program to monitor the quality of its waters and prepare a report describing the status of its water quality. Section 305(b) of the CWA requires that the quality of all waterbodies be characterized and Section 303(d) requires that states list any waterbodies that do not meet water quality standards (known as polluted or impaired waters) and establish Total Maximum Daily Loads (TMDLs) for the source causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a waterbody without causing impairment. There are no Impaired Waters or TMDLs on Fort Wainwright.

Section 404 of the CWA requires authorization from the USACE for the discharge of dredge or fill material into waters of the United States, including wetlands. The USACE can provide such authorization through issuance of individual, nationwide, and/or regional general Section 404 permits. Section 401 of the CWA provides states with the legal authority to review an application or project that requires a federal license or permit (e.g., Section 404 permit from USACE) that might result in a discharge into a water of the United States. Under Section 401 of the CWA, ADEC is responsible for reviewing projects that involve a discharge into a water of the United States and require federal approval. In Alaska, such activities also require receipt of a Section 401 Water Quality Certificate of Reasonable Assurance or a waiver from ADEC. By agreement between USACE and ADEC, an application for a Nationwide Section 404 Permit may also serve as an application for an ADEC 401 Certification. ADEC has the authority to review and approve, condition, waive, or deny a 401 Certification under Section 401.

ADEC and ADNR are the primary state agencies largely responsible for administering Alaska’s environmental laws, regulations, and environmental permits related to water quality and quantity, wetlands, water withdrawal, discharges, storm water, and water and sewage treatment. The Water Management Section of the ADNR Division of Mining, Land and Water oversees the management and appropriation of Alaska’s surface water and groundwater. In Alaska's Constitution, water was declared a public resource belonging to the people of the state to be managed by the state for maximum benefit to the public (ADNR 2019a). All surface and subsurface waters on all lands in Alaska are reserved to the people for common use and are subject to appropriation in accordance with the Alaska Water Use Act (ADNR 2019a).

In 2009, ADEC became the APDES permitting authority for Alaska. ADEC’s Storm Water Program, which is intended to reduce or eliminate pollutants in storm water, manages discharge criteria to water for compliance with Section 402 of the CWA. The ADNR Water Resources Section is responsible for adjudicating water rights, providing technical hydrologic support, and ensuring dam safety in Alaska. The mission of the ADNR Division of Mining, Land and Water is to provide appropriate use and management of Alaska's state-owned land and water, with a maximum use that is consistent with the public interest.

Fort Wainwright's storm sewer system is regulated as a small MS4. Regulated small MS4s are defined as small MS4s located in "urbanized areas" as defined by the Bureau of the Census, and those small MS4s located outside of urbanized areas that are designated by APDES permitting authority. All construction projects smaller than 1 acre but larger than 5,000 square feet are required to develop an Erosion and Sediment Control Plan (Fisher 2017).

FEMA is responsible for determining flood elevations and floodplain boundaries to evaluate flood potential and distributing Flood Insurance Rate Maps that identify the locations of special flood hazard areas. Federal regulations governing development in a 100-year floodplain are set forth in 44 CFR Part 60, which enables FEMA to require municipalities that participate in the National Flood Insurance Program to adopt certain flood hazard reduction standards for construction and development within floodplains. FEMA defines the 100-year floodplain as the area that has a 1 percent chance of inundation by a flood event in a given year. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, Floodplain Management, requires federal agencies to reduce the risk of flood loss; restore and preserve the natural and beneficial values served by floodplains; and minimize the impacts of floods on human safety, health, and welfare. The FNSB Title 15 ordinance describes construction requirements for new development occurring in flood hazard areas as mapped and defined by FEMA. A building and construction permit from the FNSB is required to build structures in the regulated floodway (USAG Fort Wainwright 2019).

3.12.1.3 Current Condition

Surface Water

The Fort Wainwright Main Post occupies portions of both the Chena River watershed and the Tanana Flats watershed within the Tanana River basin. The Chena River watershed has a total area of 2,115 square miles with elevations that range from 5,280 feet at its highest point to 420 feet where it joins the Tanana River (Vuyovich and Daly 2012). The Tanana Flats watershed drains an area of about 4,470 square miles (Figure 3.12-1). The Tanana River is glacial in origin, whereas the Chena River is a non-glacial river system. Both watersheds are underlain by discontinuous permafrost (Vuyovich and Daly 2012, CEMML 2004).

Major streams near the Main Post include the Chena and Tanana rivers (Figure 3.12-2). The Chena River generally flows west through the northern portion of the Main Post. The Tanana River flows west/northwest along the southern edge of the Main Post, just north of the Tanana River Flats Training Areas on Fort Wainwright. Terrain is gently sloping in this area; the Tanana River flows along the northern edge of the Tanana-Kuskokwim lowland (USAG Fort Wainwright 2013b). The Main Post area also encompasses multiple lakes, ponds, wetlands, and small tributary streams.

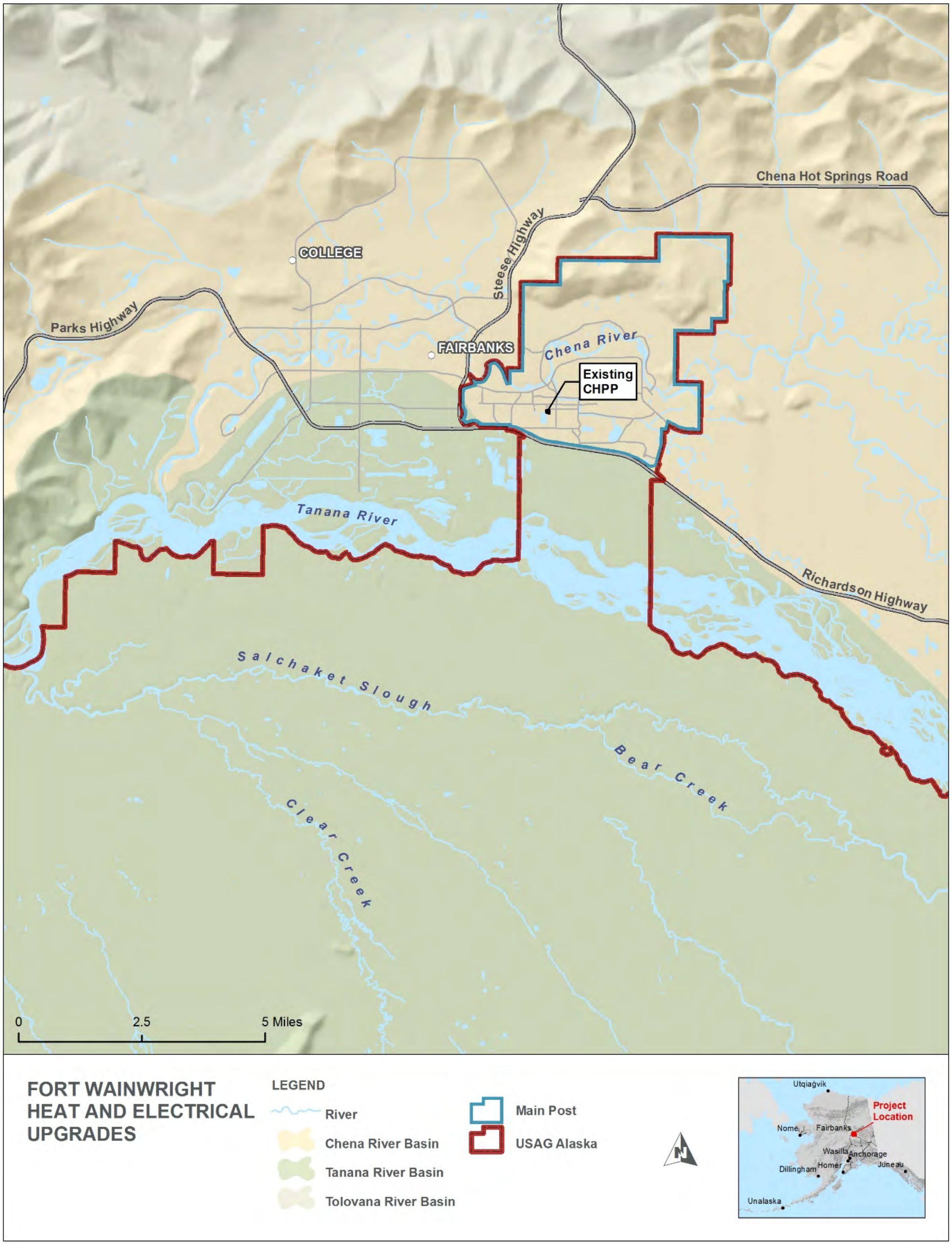


Figure 3.12-1. Surface Water Drainages in the Vicinity of Fort Wainwright

Figure 3.12-2. Surface Water Features on Fort Wainwright

The water feature located nearest to the CHPP is a large pond located directly south and nearly adjacent to the CHPP. The pond, which once functioned as a cooling pond during CHPP operations, was removed from service and replaced by an air-cooled condensing system. In addition to the cooling pond, a small pond is located approximately 1,000 feet west of the CHPP and is a part of the installation's wastewater treatment system. Monterey Lake, approximately 0.75 mile southeast of the CHPP, is a 7.5-acre lake that contains stocked populations of rainbow trout and Chinook salmon.

Water resources are largely influenced by climate as well as topography. Fairbanks is characterized by moderately warm, moist summers and cold, dry winters (Vuyovich and Daly 2012; USAG Fort Wainwright 2017a, 2019). Average temperatures range from 75°F in summer to below -33°F in winter (USAG Fort Wainwright 2019). Temperatures drop below freezing in the fall and snowfall normally accumulates in early October through April or May (Vuyovich and Daly 2012). Snowfall makes up about 35 to 40 percent of the total annual precipitation, which on average ranges from about 10 to 20 inches (Vuyovich and Daly 2012, USAG Fort Wainwright 2019). The heaviest precipitation normally falls as rain in July and August (Vuyovich and Daly 2012).

The Chena River has several designated uses under Section 303 of the CWA. The Chena River, from the Chena Slough to the confluence with the Tanana River and therefore within the Main Post, has been classified by the State of Alaska as Class A (suitable for agriculture, aquaculture, and industrial), Class B (suitable for water recreation), and Class C (suitable for growth and propagation of fish, shellfish, other aquatic life, and wildlife). According to the RPMP for Fort Wainwright, the overall quality of surface water throughout Fort Wainwright is generally good (USAG Fort Wainwright 2017a). The Chena River, which receives both sheet (surface) and point (outfall) flow from the Main Post, had been listed as impaired (polluted) for petroleum hydrocarbons, oil and grease, turbidity, and sediment, beginning in the 1990s. Army-related industrial activity has contributed to surface and groundwater pollution (USAG Fort Wainwright 2013b, 2017a). The Army has implemented measures to improve water quality; for example, LUSTs have been removed and petroleum products and other chemicals are now stored in ASTs surrounded by containment berms (USAG Fort Wainwright 2013b, 2017).

As a result of multiple cleanup and stream restoration efforts in Fairbanks and throughout the installation, water quality has improved and ADEC removed the Chena River from Alaska's CWA Section 303(d) list (EPA 2019e). The Chena Slough, which is located upstream of the Main Post, was previously listed as impaired but is now meeting Section 303(d) objectives (ADEC 2018c). Noyes Slough, which is a side channel of the Chena River located less than a mile downstream from Fort Wainwright, continues to be listed as impaired for petroleum hydrocarbons, oil, and grease (ADEC 2019e).

Groundwater

Groundwater is one of Fort Wainwright's most valuable natural resources and is the source for drinking water on the installation (USAG Fort Wainwright 2017a). The Main Post, as well as most of Fairbanks, is located on an alluvial plain between the Chena and

Tanana rivers that is underlain by a relatively shallow, unconfined sand and gravel aquifer (Glass et al. 1996, USAG Fort Wainwright 2017a). The Tanana Basin alluvial aquifer is the main aquifer that provides approximately 95 percent of all drinking water for Fort Wainwright, Fairbanks, and surrounding areas (EPA 1997, Doyon Utilities 2013). Groundwater is typically encountered about 5 and 10 feet below ground surface (Glass et al. 1996), although levels fluctuate seasonally by several feet and are highly influenced by the Tanana and Chena rivers (USAG Fort Wainwright 2017a). Groundwater levels are highest in late spring and early summer and drop in the fall and winter with the lowest levels just before the spring melt (USAG Fort Wainwright 2019).

The gradient of the Tanana River is steeper than that of the Chena River in the Fort Wainwright area. Groundwater typically flows northwest from the Tanana River into the Chena River in the Main Post (Glass et al. 1996). Groundwater gradients reverse when the Chena River reaches high stage conditions, and water flows into the aquifer. When the stage drops in the Chena River, groundwater gradients resume normal trends and flow back toward the Chena River (Wegner 1997).

There are localized areas of shallow groundwater contamination from industrial and military activities (USAG Fort Wainwright 2019). Figure 3.12-3 displays plumes of known contamination. Leaking USTs, old chemical storage facilities, and the past practice of dumping chemicals have contributed to groundwater contamination on Fort Wainwright (USAG Fort Wainwright 2017a). Pollution is generally localized, and there is no indication of deep groundwater pollution. The Army has taken measures to improve water quality and minimize the potential for groundwater contamination after pollution was recognized, by removing USTs and properly storing all POL in aboveground tanks surrounded by containment berms (USAG Fort Wainwright 2017a).

Fort Wainwright’s drinking water is supplied by groundwater. Groundwater quality is generally considered good in the Fort Wainwright area, with the exception of naturally occurring metals (USAG Fort Wainwright 2013b, 2017a). Naturally occurring metals that influence groundwater quality include iron, arsenic, and antimony (USAG Fort Wainwright 2017a, 2019a). Arsenic and antimony were previously found to exceed primary drinking water standards in groundwater, and iron levels have been found to exceed secondary drinking water standards (U.S. Geological Survey 2001 as cited in USAG Fort Wainwright 2019). Water quality was reported to meet or exceed state and federal drinking water standards and required minimal treatment before distribution. Drinking water contaminated with perfluoroalkyl and polyfluoroalkyl substances (PFAS) has been identified in Fairbanks, likely as a result of aqueous firefighting foams (Deglin 2017). PFAS levels in the Fort Wainwright water system are currently well below EPA thresholds (USAG Fort Wainwright 2019b).

For the area within the Main Post, three subsurface water use authorizations have been issued: one water right permit (LAS31230) for Fort Wainwright’s community water system and two certificates (LAS13099 and LAS19870) for wells located along the Richardson Highway for the ADOT&PF (ADNR 2019b).

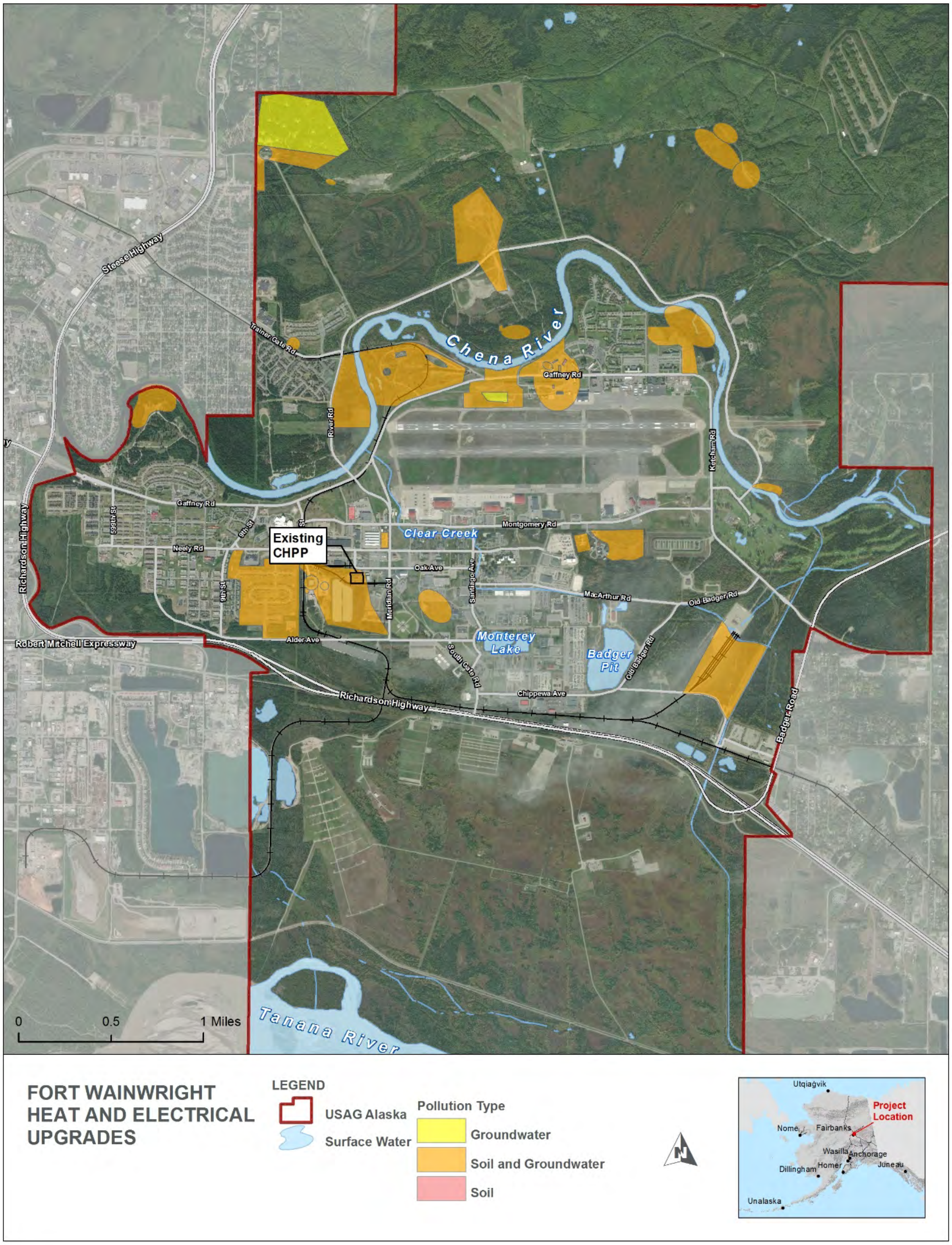


Figure 3.12-3. Known Contamination of Soil and Groundwater

Floodplains

Flood flows on the Chena River are regulated by the Chena River Lakes Flood Control Project, which is located about 17 miles east of Fairbanks and operated by the USACE. The Flood Control Project consists of the Moose Creek Dam on the Chena River, Moose Creek Floodway, Tanana River Levee, and an interior drainage network between the Chena and Tanana rivers (USACE 2017a).

Fort Wainwright is located within a recognized Flood Hazard Area (Figure 3.12-4), although a large portion of the installation, including the existing CHPP, is protected from anticipated 100-year flood events from the Chena River Lakes Flood Control Project (USAG Fort Wainwright 2017a). The last 100-year flood event on Fort Wainwright was recorded in 1967 and is what prompted the Chena River Lakes Flood Control System (USAG Fort Wainwright 2017a). FEMA identifies the Chena and Tanana rivers and directly adjacent lands as Regulatory Floodways, Zone AE (Floodway). FEMA identifies most of the Main Post as being within a Flood Hazard Area, Zone X (area with reduced flood risk due to levee). Additionally, FEMA identifies two small streams within the Main Post as Zone A, which means that these areas are subject to flooding but no base flood elevations were available. Many drainage ditches associated with the storm water system discharge directly to the Chena River in the vicinity of the airfield. High-water events in this area have the potential to backlog the drainage system with water, impeding water flow and overloading localized areas (USAG Fort Wainwright 2017a).

Storm Water

Storm water captured in and around the CHPP is conveyed throughout the installation primarily through ditching, swales, and/or open channel flow. Closed conduit conveyance systems are used in the airfield and North Post areas and at culverted road crossings (USAG Fort Wainwright 2017a). Discharges from the Installation are regulated under ADEC Permit AKS055859 (ADEC 2016). The Fort Wainwright storm water system includes multiple outfall points along the Chena River, Badger Pit, and retention areas throughout the base (Figure 3.12-5). The SWMP for the Fort Wainwright small MS4 provides a detailed description of the storm water system, along with each outfall, on the cantonment (CEMML 2016).

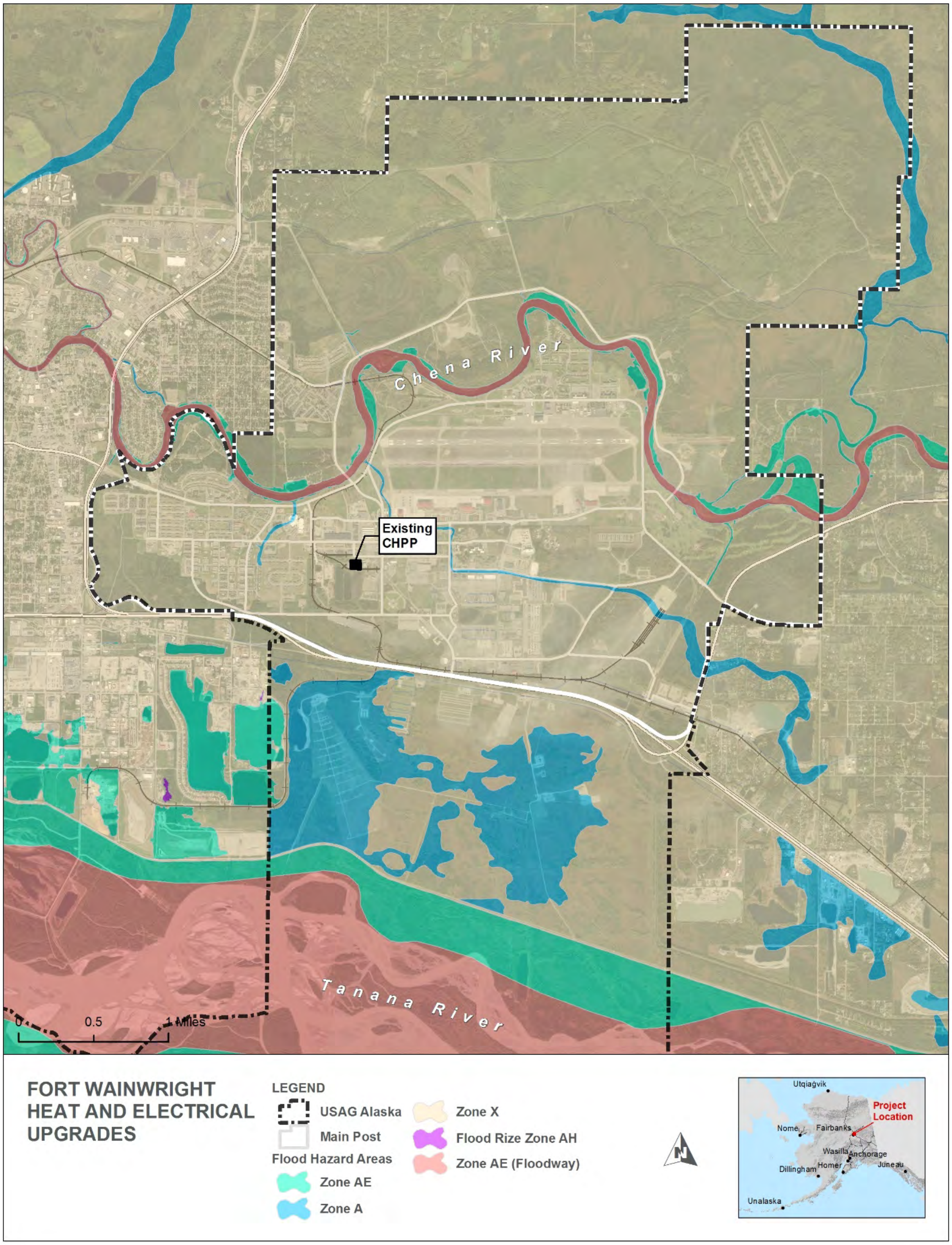


Figure 3.12-4. Fort Wainwright Flood Hazard Areas

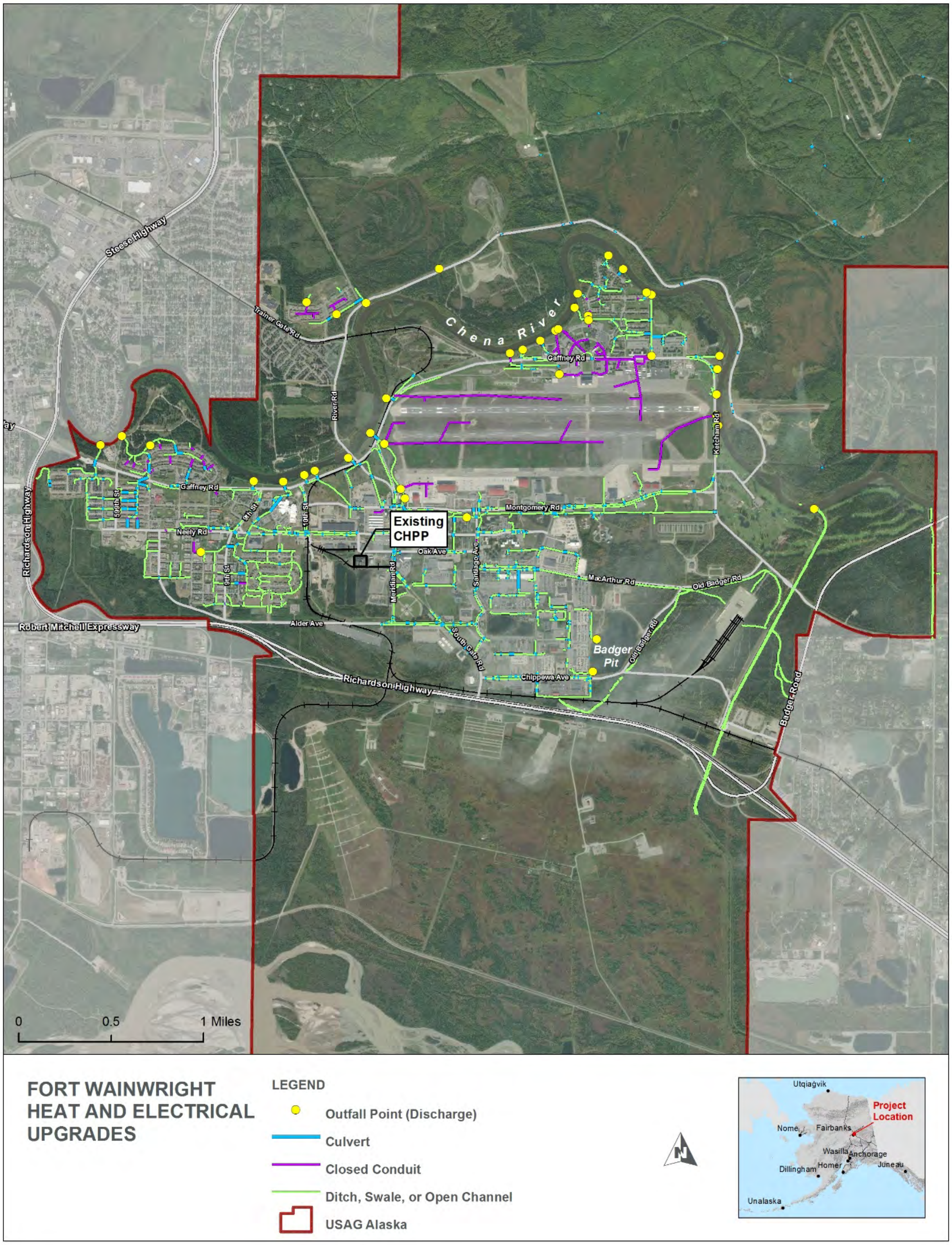


Figure 3.12-5. Fort Wainwright Storm Water Outfalls

Aside from a small amount of sediment capture in retention basins, storm water is not treated before discharge into the Chena River or Badger Pit. Chena River stage has a substantial impact on infiltration capacity of nearby soils as well as water levels and conveyance capacities of connected storm water channels. A recent study concluded that areas in and adjacent to the airfield and old installation areas are not adequate for storm water retention and conveyance because of age and structural condition of the network; insufficient capacity makes these areas vulnerable to flooding during peak rainfall events (Warner College of Natural Resources 2013 as cited in USAG Fort Wainwright 2017a). Because of water retention and conveyance capacity concerns in these areas, it is important to protect the storm water system during new construction, maintenance activities, and ongoing upgrades at Fort Wainwright. Further, protection of the storm water system is an important component to consider during the installation of new construction and associated load on the storm water system (USAG Fort Wainwright 2017a).

In October 2017, the Army completed a storm water survey of every inlet, catch basin, and outfall at the installation. The Army monitors storm water runoff from each outfall quarterly to determine whether the outfalls comply with applicable regulations and prepares annual reports to convey results (USAG Fort Wainwright 2019b). Consistent with conditions in the MS4 permit, the Fort Wainwright SWMP provides for minimum control measures for storm water runoff control and post-construction storm water drainage systems at construction sites in the urbanized area of Fort Wainwright (CEMML 2016). Project-specific Storm Water Pollution Prevention Plans (SWPPPs) are required to address additional concerns and mitigation considerations for individual construction projects, which must be reviewed by the MS4 manager along with stormwater conveyance designs before the start of ground-disturbing activities.

3.12.2 Environmental Consequences

3.12.2.1 Significance Criteria

A significant adverse impact on water resources would result if an Army action were to result in any of the following:

- Alter the existing pattern of a surface water or groundwater flow or drainage in a manner that would substantially inhibit the currently viable uses of the water within or outside the region
- Degrade the quality of surface water and/or groundwater in a manner that would substantially reduce the existing or potential beneficial uses of the water
- Violate any water quality standard, safe drinking water standard, or waste discharge requirement

3.12.2.2 No Action Alternative

The No Action Alternative would not result in significant impacts on water resources. Maintenance work on the existing CHPP, utilidors, and other heat and power utility systems would occur as needed. Maintenance could include excavation and other ground-disturbing work that may influence surface water runoff, similar to ongoing maintenance that periodically occurs or that would occur under any one of the action alternatives described in the subsections below. Such activity could influence surface water runoff and water quality by temporarily increasing sediment loads during and immediately after ground-disturbing activities. Although ground-disturbing activities would principally occur in areas previously disturbed for past construction, activities could potentially release previously contaminated soils into the environment, if such contamination is encountered. Adverse impacts resulting from maintenance-related activities that may be necessary under the No Action Alternative could be largely minimized through measures set forth by permitting requirements.

The No Action Alternative would not be expected to adversely affect the quality or quantity of water resources, including surface water, groundwater, floodplains, and storm water conditions, as long as maintenance activities adhere to local, state, and federal regulatory requirements. Fort Wainwright's SWMP describes the minimum control measures necessary for construction site storm water runoff control and post-construction storm water drainage systems in the urbanized area of Fort Wainwright (CEMML 2016).

3.12.2.3 Alternative 1 (Build a New Coal CHPP)

Short- and long-term, negligible to minor, adverse impacts would be expected on water resources. Alternative 1 would involve constructing a new coal CHPP, upgrading or constructing portions of a new associated steam distribution system throughout the installation, and demolishing the existing power plant. Ground-disturbing activities, such as excavating and grading, could result in the release of construction-generated sediments into the storm water conveyance system. Storm water runoff, which is not treated before discharge, could become contaminated with construction-related chemicals, such as fuels, oils, and/or solvents if not properly contained. In the event of a spill of fuel or other hazardous materials, minor adverse impacts on water resources could occur if not remediated appropriately.

As surface flow increases during and immediately after storm events, the potential risk for adverse impacts on surface water quality, such as higher sediment loads and potential distribution of contaminants, increases. As described in Section 3.4, Hazardous and Toxic Materials and Wastes, disturbing soils for new construction and repair of utilidors could result in remediation of some previously contaminated areas. If contaminated soils were inadvertently exposed, captured by surface water runoff, and not properly treated, impacts on water resources could range from minor to significant, especially because storm water runoff is not treated before discharge.

Construction of Alternative 1 would require acquisition of a project-specific SWPPP and adherence to the existing SWMP to minimize potential adverse impacts on water resources. Construction activities throughout the installation must comply with APDES storm water permitting requirements for construction. When construction activities occur within the boundaries of the Fort Wainwright MS4, the installation is required to ensure that construction and post-construction measures for erosion and sediment control BMPs are met.

Construction and operations of Alternative 1 could result in an increase in impervious surface over existing conditions, primarily caused by construction of a new power plant building. An increase of impervious surfaces also decreases land that is available for groundwater recharge. The amount of increased impervious surfaces that could result from the proposed project, however, is not anticipated to have more than minor impacts on groundwater availability. The creation of impervious surfaces has the potential to decrease the quality of storm water while increasing the quantity and flow of storm water, particularly during and immediately after storm events. An increase in the quantity and velocity of storm water into the existing storm water system may affect its ability to adequately convey flows. If flows increased substantially, flooding could result. Because construction would require obtaining permits and adhering to local, state, and federal storm water regulations, significant impacts could be avoided. Storm water BMPs and the existing SWMP would largely attenuate potential long-term adverse impacts that Alternative 1 could have on water quality and quantity. The existing SWMP describes the minimum control measures necessary for storm water runoff control on a construction site and post-construction storm water drainage systems in the urbanized area of Fort Wainwright (CEMML 2016).

3.12.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Alternative 2 would involve constructing a new CHPP with a natural gas and fuel oil turbine generator and associated steam distribution system throughout the installation and demolishing the existing power plant. Additionally, the coal storage area would be closed and treated in accordance with state and federal regulations (e.g., CERCLA and ADEC). Natural gas and ULSD, if applicable, would be delivered to the installation, instead of coal.

Potential impacts on water resources would be similar to those described under Alternative 1. In addition, shipment of natural gas to the installation under this alternative would occur by freight train, truck, or a pipeline from Fairbanks. Potential short-term impacts on water resources could occur during pipeline construction activities, and appropriate BMPs such as use of silt fences would be followed. A low risk of a spill could affect water resources and would be addressed as described in Section 3.4. BMPs would be the same as described under Alternative 1. Although some discharges required for Alternative 2 may not be covered under the existing MSGP, the Army would obtain and follow stipulations of other necessary permits, where required.

3.12.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Alternative 3 would involve installing multiple natural gas-fired boilers throughout the installation, instead of constructing a new, centralized power plant. The new boilers would likely be housed within existing structures; new additions to existing structures; or new, smaller, and dispersed heating-plant buildings that would heat a handful of nearby buildings. Like the other two build alternatives, Alternative 3 would upgrade the existing steam distribution system as required and demolish the existing power plant. Similar to Alternative 2, the coal storage area would be closed and treated in accordance with state and federal regulations and natural gas would be used at the installation instead of coal. Potential impacts on water resources would be similar to those described under Alternative 2. BMPs would be the same as described under Alternative 1. Although some discharges required for Alternative 3 may not be covered under the existing MSGP, the Army would obtain and follow stipulations of other necessary permits, where required.

3.13 Cultural Resources

3.13.1 Affected Environment

This section describes cultural resources located within the Fort Wainwright Main Cantonment Area, which primarily consist of World War II and Cold War era buildings, some of which are historic properties. The ROI for cultural resources is the Fort Wainwright Main Cantonment Area, which is the area where direct or indirect effects would likely occur. Impacts on cultural resources beyond this area are not anticipated. The primary resource that could be affected is Ladd Field NHL, designated for the significant role the location played in the United States' war effort during World War II and cold weather testing. This section also characterizes the cultural and historical context of the area.

3.13.1.1 Definition of Resource

Cultural resources commonly refers to physical material items associated with past human activities. Historic properties are defined under the NHPA (54 U.S.C § 300308) as, "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP)," and also includes places such as traditional cultural properties, cultural landscapes, sacred sites, ethnographic landscapes, and vernacular landscapes (Page et al. 1998). This analysis focuses on verifiable remains, material evidence, and specific locations that are reported in the NRHP; the Alaska Heritage Resources Survey (AHRS), maintained by the ADNR Office of History and Archaeology; and cultural resources data maintained by Fort Wainwright.

The cultural resources study area for potential effects to cultural resources has been defined as the Main Cantonment Area south of the Chena River and north of the Richardson Highway (Figure 3.13-1). The existing power plant and power plant alternatives are centrally located in the Main Cantonment Area. This portion of the Main Cantonment Area contains historic properties that may be subject to direct and indirect impacts as a result of the heat and electrical upgrade alternatives.

Figure 3.13-1. Historic Properties

3.13.1.2 Environmental Laws, Regulations, and Executive Orders

CEQ NEPA regulations at 40 CFR § 1502.15 and § 1502.16 require descriptions of known historic and cultural resources that may be affected by proposed federal project actions and alternatives, as well as attention to the effects to historic or cultural resources resulting from such actions and each alternative. Title 40 CFR § 1508.27(8) requires agencies to account for the degree to which "the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historical resources."

Similarly, the NHPA requires agencies to account for the effects of their undertakings on historic properties, which are defined in Section 3.13.1.1. Under Section 110 of the NHPA, agencies must also "to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm" to any NHL that may be directly and adversely affected by an undertaking. Special considerations regarding NHLs are described in the implementing regulations of the NHPA at 36 CFR § 800.10.

Army installations are required to follow AR 200-1 regarding cultural resources management. AR 200-1 describes requirements under multiple laws pertaining to cultural resources, and designates the Garrison Commander as the agency official responsible for compliance with Section 106 of the NHPA. USAG Alaska also maintains a Programmatic Agreement (PA) under Section 106 of the NHPA with the State Historic Preservation Officer (SHPO) regarding the operation, maintenance, and development of the Army installation. The PA identifies select Army activities that qualify for streamlined review under Section 106 (Army 2016a).

3.13.1.3 Current Condition

Interior Alaska is archaeologically important at a regional level for the development of Native American cultures dating to more than 14,000 years ago. At a continental scale, Alaska is significant for its role as the entry point of the initial human colonization of the New World. The prehistoric cultural history of Fort Wainwright mirrors that of other portions of central Alaska, and has been presented in detail in the Fort Wainwright *Integrated Cultural Resources Management Plan* (USAG Alaska 2020b) and in other sources (e.g., Potter 2008, Holmes 2008, Holmes et al. 1996). Previous archaeological surveys have not resulted in the identification of archaeological sites in the study area, which was previously disturbed by the construction of the military installation before the passage of cultural resource laws mandating protections for archaeological resources. A synopsis of the regional prehistoric chronology of Interior Alaska is provided in Table 3.13-1.

Table 3.13-1. Prehistoric Chronology of Interior Alaska

Cultural Tradition/Age	Environment/Subsistence	Artifacts/Tools
Late Glacial Period Diuktai Complex 14,000–13,000 years ago	Relatively warm and wet conditions with vegetation composed of ferns, mesic graminoid meadows, xeric-steppe, steppe-tundra, and herb tundra. Fauna consisting of bison, wapiti, and small, extinct species such as mammoth, horse, and bison (Zazula et al. 2007). Land bridge connects Siberia and Alaska.	Bifacial, willow-leaf bifaces, microblades, wedge-shaped microblade cores. Sites include Broken Mammoth CZ4, Mead CZ5, and Upward Sun River (Holmes 2008, Potter 2011).
Late Pleistocene to Early Holocene 13,000–11,500 years ago Nenana Complex	Younger Dryas Climactic event, characterized by cool and dry conditions. Vegetation dominated by shrub tundra. Greater proportion of small game, birds, and fish on landscape, although large mammals remained abundant (Björck 2007, Bigelow and Edwards 2001, Potter 2011).	Bifaces, planar scrapers, end scrapers, and triangular or tear-drop Chindadn points (Powers and Hoffecker 1989). Sites include Mead CZ3, Broken Mammoth CZ3, Upward Sun River Component 2, Swan Point CZ3.
Early Holocene 11,500–6,000 years ago Denali Complex	Associated with Holocene Thermal Maximum, associated with warm and dry conditions and warmer than modern summers and cooler than modern winters. Shrub-birch and willow are major component of vegetation communities (Abbott et al. 2000, Bigelow 2013). Trees increase habitat and open woodlands develop.	Wedge-shaped microblade cores, burins, bifacial knives, end scrapers, and lanceolate projectile points. Gerstle River Component 1, Upward Sun River CZ3 and CZ4.

Cultural Tradition/Age	Environment/Subsistence	Artifacts/Tools
Middle Holocene Northern Archaic Tradition 5,000–2,000 years ago	Development of modern boreal forests, increasing moisture, decreasing summer temperatures (Bigelow 1997).	Side notched points, large choppers, lanceolate points, end scrapers, notched pebbles, crescent-shaped bifaces, and microblade and burin technology. Broken Mammoth CZ1b and CZ1a, Mead CZ1a, and Swan Point CZ1a and CZ1b (Holmes et al. 1996).
Late Holocene Athabascan tradition 2,000 years ago - present	Completed transition to modern vegetation communities. Little Ice Age (900–200 calibrated years before the present) affects floral and faunal communities in Interior Alaska. Extinction of bison, increasing abundance of moose (Potter 2008).	Storage features, toolkit focused on use of salmon along rivers, use of bow and arrow, decline in formal chipped stone technologies (Potter 2008).

Note:
CZ – cultural zone

The historic period in the study area begins during the Fur Trade, when Russian missionaries and traders set up posts along the Yukon and Copper rivers, hundreds of miles from the location of Fort Wainwright. These expeditions were the harbingers of European and Euroamerican contact with the indigenous people of Interior Alaska. As with the prehistoric cultural history described above, the historic period of Fairbanks has been described extensively before (e.g., Neely 2001, 2003; Hollinger 2001). Historic resources that predate the establishment of Ladd Field in 1939 are not represented in the Main Cantonment Area (USAG Alaska 2020b).

The military history of Fort Wainwright began in the 1930s, when members of Congress and the military became concerned with the lack of air defense in Alaska. Eventually this interest resulted in approval for the construction of a cold-weather testing facility in Fairbanks. Construction of Ladd Field began in 1939, the same year that Germany invaded Poland beginning World War II. Following the start of World War II, Ladd Field continued to function as a cold-weather testing station until the Japanese targeted the Aleutian Islands, leading to a temporary cessation of the testing program as troops mobilized to other bases in Alaska to defend the Territory of Alaska from Japanese aggression. In 1942, Ladd Field gained additional significance as a transfer station along the Alaska-Siberia route of the Lend-Lease Program, in which the U.S. government lent aircraft to the Soviet Union to support the war effort against Germany. In total, 7,926 aircraft were transferred to the Soviets from Fort Wainwright (Price 2004).

The United States entered into the Cold War with the Soviet Union soon after World War II. Because of its location near eastern territories of the Soviet Union, and its importance along trans-polar air routes, Alaska became a focal point for strategic operations. In 1947, the Air Force became a separate branch of the military, and Ladd Field became an important focal point for Air Force Cold War operations. Ladd Field "served as a northern hub for Air Force activities in Alaska" and was "centrally involved in Cold War missions of the Alaskan Command and in the transient missions of other military units, including the Strategic Air Command" (Price and Sackett 2001). From 1947 to 1961, the airfield operated as Ladd AFB and missions consisted of strategic aerial reconnaissance, air defense, search and rescue, and research, including cold weather, arctic aeromedical laboratory, and ice station testing (Price and Sackett 2001). In 1961, the airfield was transferred to the Army and renamed Fort Jonathan Wainwright. A synopsis of the historical chronology of the study area is provided in Table 3.13-2.

Table 3.13-2. Historic Themes Related to Fort Wainwright and the Fairbanks Region

Time Frame	Historic Theme	Synopsis
1810s–1880s	Fur trade	Russians traders set up trade posts at Nulato on the Yukon River, and at Taral on the Copper River during the 1810s. The British established Fort Yukon in 1847. These posts, located in areas peripheral to the study area, resulted in the introduction of the fur trade and new material culture to indigenous people in central Alaska. In the 1860s contact became more regular between Athabascans and Euro-American traders. In the 1880s Americans established additional posts on the Yukon at Tanana, Belle Island, and Fort Yukon.

Time Frame	Historic Theme	Synopsis
1880s–1920s	Historic gold rush and mining	In the 1880s, gold discoveries occurred in the Klondike region of Canada, causing an influx of prospectors. In late 1890s, significant gold deposits were identified along the Tanana River. In 1902, Felix Pedro discovered gold near Fairbanks, leading to the establishment of Fairbanks at the site of a Barnett’s trading post. During the 1910s, gold production waned due to depletion of shallow prospects accessible to small-scale prospectors.
Early 20th Century	Homesteading	Agricultural homesteads were established on portions of the Fort Wainwright Main Cantonment, providing Fairbanks with agricultural goods. These homesteads are later absorbed by construction of Ladd Field and Fort Wainwright.
1900–1940s	Transportation	Use of historic trails such as the Valdez-Fairbanks trail increased and roadhouses were established to support access by dogsled, horse, and foot travel. Alaska Railroad was completed in 1923. Alaska Highway was constructed in 1942.
1939–1945	Establishment of Ladd Field and American Entry to World War II	1939, Ladd Field was constructed for use as experimental cold weather testing station for Army aircraft. Starting in 1942, Ladd Field served as a focal point in the Lend-Lease Program, supplying more than 7,900 aircraft to the Soviet Union to support the war effort in the European theater. By 1945, Ladd Field had expanded dramatically to support wartime efforts.

Time Frame	Historic Theme	Synopsis
1947–1990	Cold War	Cold War began in 1947 when the United States adopted the Truman Doctrine of Soviet Containment. 1947, Ladd Field was redesignated as Ladd AFB. Ladd AFB served as Northern Sector Command, supporting air defense and strategic reconnaissance of the Soviet Union. The base continued to support arctic research activities. 1961, Army took command of Ladd AFB and renamed it Fort Jonathan Wainwright. Ladd AAF is the name of the military airfield located at Fort Jonathan Wainwright. 1991, the Cold War ended with the collapse of the Soviet Union.

Source: USAG Alaska 2020b.

The subsections that follow describe current conditions related to historical buildings and structures, archaeological resources, and traditional cultural properties at Fort Wainwright and summarize the Army's consultation with SHPO and Alaska Native tribes.

Historic Buildings and Structures

Ladd Field National Historic Landmark. In 1985, Ladd Field was designated as an NHL for its national historic significance during World War II in the Pacific for the period 1939–1945. The NHL is also significant under the themes of Expanding Science and Technology, for its role in cold-weather testing; under the theme of Shaping the Political Landscape, as the center of operations in the Alaska Theater of War; and under the theme of the Changing Role of the United States in the World, as the hub of the Alaska-Soviet Lend-Lease Program, in which the United States transferred 7,926 military aircraft to the Soviet Union to aid in the European theater during World War II (Cook and Woster 2018).

The 1985 NHL nomination included 24 World War II age buildings. In 2018, the NHL was re-evaluated because of airfield changes resulting from accidental destruction or demolition of structures since the original nomination. Although the re-evaluation has yet to be approved, it proposes reduction of the NHL boundary, removal of demolished buildings, and addition of structures outside of the period of significance. Under the 2018 nomination, the Ladd Field NHL (FAI-00236) contains 19 contributing World War II buildings; two runways; a utilidor system; the north taxiway; and a parade ground. Changes documented in the re-evaluation resulted in the loss of integrity south of the airfield. The NHL is located in the north-central portion of the Main Cantonment and covers an area of 1,127 acres (Figure 3.13-1). All structures located within the boundary of the NHL continue to be used in present day operations of Fort Wainwright.

Ladd AFB Cold War Historic District (CWHD). The Ladd AFB CWHD (FAI-01288) covers much of the same spatial extent as the Ladd Field NHL. It is located in the northern-central portion of the Main Cantonment Area, and shares the majority of its boundary with the World War II NHL. The CWHD includes additional buildings south of the NHL and extends an additional half-mile to the south (Figure 3.13-1). In total, 36 buildings and structures were found to be contributing to the CWHD as a result of building evaluations conducted in 2010 (Bittner 2010). Several buildings within the CWHD are also contributing resources to the NHL, but have gained additional significance under historic themes relevant to the Cold War following the end of World War II. Buildings within the CWHD served numerous purposes necessary to the operations of the base during the Cold War, and include building types such as troop housing buildings, a chapel, a garage, officers and commander's quarters, non-commissioned officers quarters, warehouses, communications facilities, headquarters, airfield operations, ordnance storage, hangars, and ammunition bunkers (USAG Alaska 2020b). Similar to the NHL, the boundary of the CWHD contains various modern structures and other buildings that do not contribute to its historic significance. The CWHD originally included 68 contributing resources under documentation submitted in 2001 but was re-evaluated in 2010 because of changes at the base resulting from current military operations. The 2010 re-evaluation resulted in the removal of 32 buildings from the district and a reduction in the boundary area (Bittner 2010).

Additional Historic Properties and Historic-Age Structures. The AHRS database contains hundreds of additional documented resources beyond the boundary of the NHL and CWHD in the Main Cantonment Area. Although historic in age, these structures do not meet the eligibility criteria for listing in the NRHP either individually or as contributing elements to a historic district. Two exceptions are AHRS sites FAI-01283, the Arctic Aeromedical Laboratory Building, and FAI-01789, Chena Elementary.

Site FAI-01283, the Arctic Aeromedical Laboratory Building, is a two-story concrete structure constructed in 1955. The building was determined to be eligible for inclusion in the NRHP in 2001 as significant for its association with the Cold War on national and local levels. The structure is eligible individually and as a contributing building within the Ladd AFB CWHD (FAI-01288). Character-defining features of the building include "overall size and massing, the fenestration pattern, the minimal decorative features including the pilasters, string course and the vertical fixed windows and its bilateral symmetry" (Meeks 2011). Site FAI-01789 is Chena Elementary, a structure determined to be eligible for inclusion in the NRHP under Criterion C (architecture), at a state level, with a period of significance of 1964 (Bittner 2010).

Site FAI-01279, Building 3595, CHPP, is the existing power plant at Fort Wainwright. The building was previously determined to be eligible for the NRHP as a contributing element of the Ladd AFB CWHD (FAI-01288). A combination of building modifications and a structure fire with subsequent repairs led to a later determination that the power plant no longer contains integrity necessary to be eligible for the NRHP. The SHPO concurred with this finding in 2010 (Bittner 2010).

Archeological Resources

The entire Main Cantonment Area has been surveyed for archaeological resources and has been extensively disturbed by the construction of the military installation. No previously recorded prehistoric archaeological sites have been recorded within the Main Cantonment Area. The archaeological sites closest to the Main Cantonment Area are located in the Main Post north of the Chena River, and include AHRS sites FAI-00199 (3,280 feet to the north), FAI-00200 (300 feet to the north), and FAI-00040 (1 mile to the northeast). Site FAI-00040 is an NRHP-eligible site that consists of large buried lithic scatter including obsidian, and is located north of Sage Hill Road. Site FAI-00199 consists of a notched point and two flakes in a gully east of the Birch Hill Ski Area. Site FAI-00200 is a notched projectile point collected from the north bank of the Chena River by an area resident in late 1979 that was plotted based on the description given by the individual. Numerous subsequent attempts to locate these sites have been unsuccessful; therefore, both sites have been determined to not be eligible for the NRHP (Esdale et al. 2014).

Traditional Cultural Properties

No traditional cultural properties have been identified to date at Fort Wainwright (USAG Alaska 2020b).

SHPO Consultation

Fort Wainwright initiated consultation with the ADNR regarding the proposed project through the EIS process. The SHPO expressed concern about the possibility of impacts on the Ladd Field NHL resulting from Alternative 3 (Install Distributed Natural Gas Boilers).

Fort Wainwright has also initiated consultation with the SHPO under the NHPA. Because of the range of alternatives and lack of an identified preferred alternative, Section 106 consultation has been limited to initiation of consultation (Cook 2019).

Alaska Native Tribes Consultation

Fort Wainwright has initiated consultation with Alaska Native tribal entities concerning the proposed project. Fort Wainwright mailed letters to tribal entities on July 23, 2019, informing them about the August 7 and August 8 agency and public scoping meetings held in Fairbanks, respectively. Tribal entities contacted regarding the project include Healy Lake Village, Northway Village, Native Village of Tanacross, Native Village of Tetlin, Nenana Native Association, Tanana Chiefs Conference, and Village Dot Lake. No comments were received from tribal entities about impacts on cultural resources during scoping.

Fort Wainwright provided letters to tribal entities about the possibility for government-to-government consultation for the proposed project. Fort Wainwright mailed letters about government-to-government consultation to Healy Lake Village, Northway Village, Native Village of Tanacross, Native Village of Tetlin, Nenana Native Association, and Village of Dot Lake. No responses were received from contacted Tribes.

Alaska Native tribal consultation was initiated under Section 106 of the NHPA. Because of the range of alternatives and lack of an identified preferred alternative, Section 106 consultation has been limited to initiation of consultation (Cook 2019). Alaska Native tribal consultation will continue for the duration of the proposed project.

3.13.2 Environmental Consequences

Because the Main Cantonment Area consists of a built environment dating to the establishment of Ladd Field, it is appropriate to evaluate impacts on cultural resources under the Section 106 rubric for evaluating adverse effects to historic properties. Under Section 106, a historic property is a resource that has been determined to be eligible for listing in the NRHP. For a property to qualify for listing on the NRHP, it must meet one of the National Register Criteria for Evaluation, by both being associated with a significant historic context and retaining integrity of features necessary to convey its significance (National Park Service [NPS] 1997).

The significance of a cultural resource is evaluated in respect to the four NRHP eligibility criteria, as defined by 36 CFR § 60.4: A, B, C, and D. Under Criterion A, a property must be associated with an event or a pattern of events. Under Criterion B, a property must be associated with the life of an individual who is “demonstrably important within a local, state, or national” context (NPS 1997). Under Criterion C, a property is significant for “physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork” (NPS 1997). Under Criterion D, a property must contain important information that can contribute to the understanding of human history or prehistory.

An adverse effect on a historic property occurs when an undertaking “may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association” (36 CFR §800.5(a)[1]).

Cultural resources analyses performed under Section 106 generally define both a direct and an indirect area of potential effects to assess the possibility of adverse effects on historic properties. In consideration of Section 106, this analysis considers an area of direct impacts on be the project footprint associated with the design alternatives. The area of direct impacts contains the full extent of ground disturbance. An area of indirect impacts is also defined, and includes the remainder of the cultural resources study area described above. Indirect effects on cultural resources, as defined in 36 CFR Part 800, include the “introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s setting that contribute to its historic significance” (36 CFR § 900.5(2)[v]).

3.13.2.1 Significance Criteria

A significant adverse impact on cultural resources would result if the Army action were to result in any of the following:

- Cause adverse effects on a historic property listed or eligible for listing on the NRHP, unless mitigated through an agreement with SHPO or ACHP
- Create conditions which would stop the traditional use of sacred or ceremonial sites or resources, in the absence of Section 106 consultation
- Violate compliance with NAGPRA or result in irretrievable or irreversible damage to burials (particularly unmarked or poorly marked cemeteries)

3.13.2.2 No Action Alternative

Under the No Action Alternative, neither a CHPP (coal or natural gas) nor a decentralized system of natural gas boilers would be constructed. Because the underlying baseline conditions would not change, no long-term, adverse impacts on cultural resources would occur.

3.13.2.3 Alternative 1 (Build a New Coal CHPP)

Long-term, minor, adverse effects on cultural resources would be expected. Under Alternative 1, a new coal CHPP would be constructed and the existing CHPP would be demolished. Decommissioning the existing CHPP would not affect cultural resources. Although the existing CHPP structure is more than 50 years old, it has previously been determined to not be eligible for the NRHP, and therefore is not a historic property as defined in Section 106 of the NHPA.

Construction of a new CHPP has the potential to modify the visual setting of historic properties at Fort Wainwright, which could change its overall character. To account for the possibility of visual effects on cultural resources, a viewshed analysis was conducted by incorporating digital terrain models and three-dimensional building renderings in AutoCAD software. Based on a stack height of 120 feet and a new CHPP height of 60 feet, Figure 3.13-2 depicts areas from which these new structures could be visible within the Main Cantonment Area and identifies locations of historical structures, Ladd Field NHL, and the Ladd AFB CWHD. Both the new CHPP building and smokestacks would be visible from Chena Elementary (FAI-01789) and from within the boundaries of the Ladd Field NHL (FAI-00236) and the Ladd AFB CWHD (FAI-01288). A 120-foot stack would also be visible from the Arctic Aeromedical Laboratory (FAI-01283).

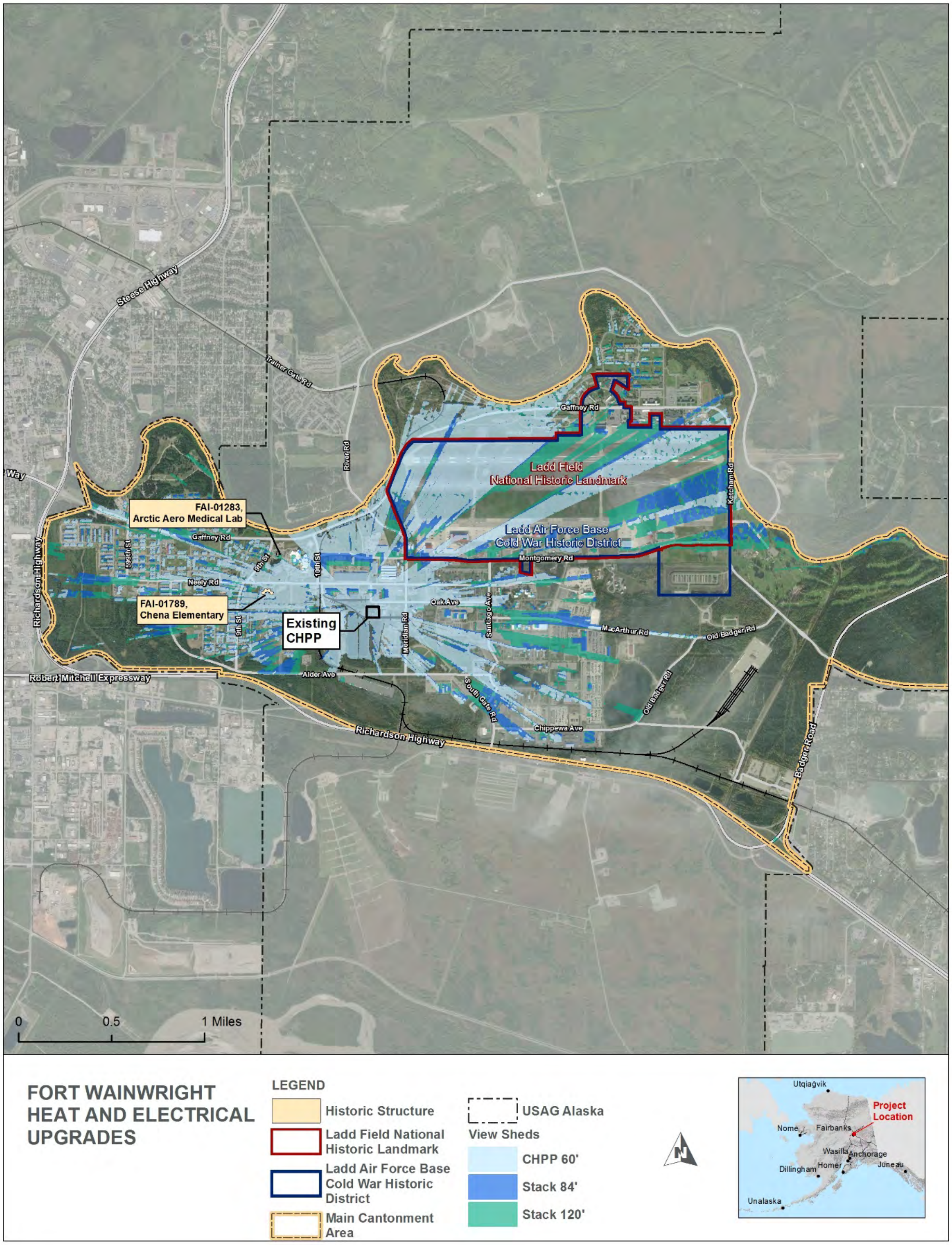


Figure 3.13-2. Historic Viewshed Analysis

The effect on the visual setting would depend on the final design of the CHPP structure and stack height. If the CHPP design were to modify the existing viewshed of historic properties, impacts would be minor. Numerous modern buildings exist in the setting of previously identified historic resources at Fort Wainwright. The construction of an additional structure visible at a considerable distance from historic properties would not result in an overall change to the setting or result in a significant impact on cultural resources.

Alternative 1 would modify the North Post Utilidor System (FAI-01242), which is a contributing resource to the Ladd Field NHL. The degree of impact associated with modifications to Fort Wainwright's historic utilidors would depend on final design specifications. Modifications to the utilidor system would require mitigation to maintain compliance under Section 106 of the NHPA. Alternative 1 would result in adverse impacts, but such impacts might be less than significant following mitigation under Section 106. Modifications to the utilidor system would be consistent with the guidance provided in *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (NPS 2017) and *FWA Aviation Stationing Mitigation: Design Guidelines for Ladd Field World War II National Historic Landmark, Fort Wainwright, Alaska*, developed in accordance with the PA among Fort Wainwright, the SHPO, and the Advisory Council on Historic Preservation (Design Alaska 2012).

Because the area where the new CHPP would potentially be constructed has previously been surveyed for archaeological and architectural resources, no impacts on either of these types of cultural resources are anticipated. No traditional cultural properties or other resources of known significance to Alaska Native Tribes are known within the Main Cantonment Area.

3.13.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Impacts resulting from the construction and operation of Alternative 2 would be the same as those described for Alternative 1.

3.13.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Long-term, significant, adverse effects on cultural resources would be expected, although impacts would be reduced with mitigation. Under Alternative 3, decentralized natural gas boilers would be constructed and electricity would be purchased from a local provider. New structures would be constructed at multiple locations on Fort Wainwright, including locations within the Ladd Field NHL and Ladd AFB CWHD. The existing North Post Utilidor System (FAI-01242) would continue to be used to the extent practicable.

Construction of new structures within the Ladd Field NHL and Ladd AFB CWHD would adversely affect the integrity of setting, feeling, and/or association of historic structures as a result of Alternative 3 and would therefore require mitigation. Potential impacts on historic structures could include modifications to the interior or exterior of contributing structures within the NHL or CWHD that directly affect their character-defining features. Modifications to non-contributing structures or the construction of new buildings within the boundaries of the NHL and CWHD also carries the potential for indirect impacts resulting from changes to historic viewsheds. A viewshed analysis to evaluate the potential visual effects was not conducted for Alternative 3 because the potential locations of new facilities have not been determined. More detailed information about the final design of Alternative 3 would be required to make a full assessment. Based on the information available, Alternative 3 would result in significant adverse effects on historic properties but with mitigation, such impacts would be reduced to less than significant.

Although the North Post Utilidor System (FAI-01242) would continue to be used to the extent practicable, changes to the system could result in significant impacts on the resource because of changes in function and context. The extent of changes to the utilidor system would depend on the scope of changes in the final design. Impacts on this NRHP-eligible historic property could include a loss of integrity of setting, feeling, and association. Mitigation under Section 106 of the NHPA would be required. Through time, disused portions of the property could also be altered by loss of integrity of materials and workmanship as the property falls into disrepair. Modifications to the utilidor system would be consistent with the guidance described for Alternative 1.

Because the Main Cantonment Area has previously been surveyed for archaeological resources, no impacts on archaeological resources would be anticipated where the new structures may be located. No traditional cultural properties or other resources of known significance to Alaska Native Tribes are known within the Main Cantonment Area.

3.14 Airspace

3.14.1 Affected Environment

The ROI for airspace is the Fort Wainwright Main Cantonment Area.

3.14.1.1 Definition of Resource

Airspace Management

The airspace environment is described in terms of its principal attributes, namely controlled and uncontrolled airspace and Special Use Airspace. Controlled airspace is a generic term that encompasses the different classifications of airspace and defines dimensions within which air traffic control service is provided to flights under instrument meteorological conditions and visual meteorological conditions. The Proposed Action includes construction of structures that could present potential flight obstructions near the ground surface, but does not involve any substantial alteration to existing airspace or aircraft operations in the ROI. Therefore, airspace conditions and management unrelated to airspace obstructions and aircraft safety are not discussed further in this EIS.

Aircraft Safety

Obstructions to flights, which include towers and power transmission lines, represent safety concerns for aircrews, especially those engaged in low-altitude flight training. Airfields have areas immediately surrounding runways where development actions may be restricted or prohibited altogether to eliminate potential obstructions that would affect safe approach to or departure from a runway. Such areas include accident potential zones (APZs), where aircraft mishaps are most likely to occur; clear zones, which are adjacent to the ends of the runway where obstructions are strictly prohibited; and imaginary surfaces along and overlying the runway and airfield, where presence of structures is restricted to enable safe landing and departure of aircraft.

3.14.1.2 Environmental Laws, Regulations, and Executive Orders

To ensure safe and unobstructed flying conditions at and around airports, the Federal Aviation Administration (FAA) requires establishment and maintenance of obstruction-free areas (i.e., APZs, clear zones, and imaginary airspace surfaces) immediately near airfields, particularly along and at the ends of runways, in Federal Aviation Regulation, Part 77 (14 CFR Part 77), Safe, Efficient Use, and Preservation of the Navigable Airspace, and FAA Advisory Circular (AC) 50/5300-13A, Airport Design (FAA 2019). Additionally, where existence or development of structures is permitted, or where tall structures may extend into the navigable airspace, guidance on specifications for obstruction marking and lighting can be found in FAA AC 150/5345-43J, Specification for Obstruction Lighting Equipment (FAA 2019); FAA AC 70/7460-1L, Obstruction Marking and Lighting (FAA 2019); and Military Specification MIL-L-6273, Light, Navigational, Beacon, Obstacle or Code, Type G-1. Obstruction marking and/or lighting on tall structures is a standard practice followed to prevent collisions during low-visibility conditions.

3.14.1.3 Current Condition

Ladd AAF on Fort Wainwright has one active runway, several ancillary taxiways, and hangars. Airfield clear zones exist adjacent to the east and west ends of the runways at Ladd AAF. APZs extend beyond the east and west ends of the runways upward into the approach surface in the airspace. The airfield imaginary surfaces continue to extend upward into the airspace to encircle the area directly overlying Ladd AAF (USACE 2013). The existing CHPP is located approximately 1,800 feet southwest of the airfield in the South Post district (refer to Section 3.8, Land Use), and includes existing smokestacks that are approximately 84 feet in height.

3.14.2 Environmental Consequences

3.14.2.1 Significance Criteria

An impact on airspace safety would be considered significant if the Army action were to result in either of the following:

- Violate FAA regulations that affect aviation safety
- Obstruct or infringe safe military, private, or commercial flight activity

3.14.2.2 No Action Alternative

With continued use of the existing CHPP plant, no changes to the existing airspace would be expected. The existing CHPP smokestacks do not interfere with clear zones and APZs associated with the airfield. Therefore, no new impacts on airspace management would occur.

3.14.2.3 Alternative 1 (Build a New Coal CHPP)

No impacts on airspace management would occur as a result of implementation of Alternative 1. To estimate the potential for obstructions, an assumed 84-foot smokestack height was input into FAA's Notice Criteria Tool (FAA 2020). Construction and operation of the CHPP under Alternative 1 would not result in obstruction of the clear zones or APZs near the airfield to have an effect on air traffic. Because the installation's existing CHPP already has smokestacks, and the new stacks would be constructed to an equivalent height and similarly equipped with aircraft warning lights (in accordance with FAA AC 150/5345-43J [FAA 2019]), no appreciable change in existing flight hazards would be expected. In accordance with 14 CFR § 77.9, because the new CHPP would be constructed in proximity to an FAA-regulated navigable facility (Ladd AAF), notice would still be filed with the FAA at least 45 days before construction starts.

3.14.2.4 Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)

Impacts on airspace management as a result of Alternative 2 would be similar to those described for Alternative 1.

3.14.2.5 Alternative 3 (Install Distributed Natural Gas Boilers)

Impacts on airspace management as a result of Alternative 3 would be similar to, but less than, those described for Alternative 1 because the smokestacks associated with Alternative 3 would be shorter. Stacks for distributed boilers would either be lower than the floors of the overhead airspace zones or sited to avoid obstructing the zones.

3.15 Cumulative Effects

In addition to identifying the direct and indirect environmental impacts of their actions, federal agencies are required by the CEQ NEPA regulations to address cumulative impacts related to their proposals. A cumulative impact is defined in the CEQ regulations (40 CFR § 1508.7) as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of 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." This section describes the process used to identify potential cumulative impacts related to the Proposed Action at Fort Wainwright and discusses those impacts for each of the resources addressed earlier in this chapter in Sections 3.2 through 3.14.

3.15.1 Approach for Assessing Cumulative Effects

Guidance used for preparing the cumulative effects analysis includes the following:

- CEQ's NEPA implementing regulations (40 CFR §§ 1500–1508)
- Environmental Analysis of Army Actions (32 CFR Part 651)
- *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b)
- Memorandum: Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ 2005)
- *NEPA Analysis Guidance Manual* (U.S. Army Environmental Command [AEC] 2007)

The cumulative effects analysis process outlined by CEQ includes identifying significant cumulative effects issues, establishing the relevant geographic and temporal (time frame) extent of the cumulative effects analysis, identifying other actions affecting the resources of concern, establishing the cause-and-effect relationship between the Proposed Action and the cumulative impacts, determining the magnitude and significance of the cumulative effects, and identifying ways in which the proposal of the federal agency might be modified to avoid, minimize, or mitigate significant cumulative impacts.

Issues to be addressed in this cumulative effects analysis were determined based on the identification of resources that would be directly or indirectly affected by the alternatives considered for implementing the Proposed Action. These resources, discussed earlier in this chapter, were identified based on information received during internal and public scoping or through the analysis of direct and indirect effects that have the potential to combine with other past, present, or reasonably foreseeable future actions to produce a larger impact. If the analysis demonstrated there would be no direct or indirect impact on a resource, it was not included in the cumulative effects analysis because the Proposed Action would not add to the cumulative impact.

3.15.2 Geographic Scope

The geographic scope, or ROI, for the cumulative impacts analysis was determined by establishing the area where projects are likely to incur impacts and interact, and by identifying the geographic areas covered by each affected resource. These geographic areas include Fort Wainwright and communities within the broader FNSB region. Other areas outside the FNSB region that could be affected by the Proposed Action are Healy (in the Denali Borough), where the coal mine is located; Point MacKenzie (in the Matanuska-Susitna Borough), the location of the only currently operating LNG facility in Alaska; and Nikiski and Valdez, where ULSD production refineries are located.

The temporal scope addressed for this analysis includes past, present, and reasonably foreseeable (future) periods of time. The time period for the past and future impact analyses varies by resource, depending on the timeframe for which data on historical or forecasted projects are available, and is approximately 10 years into the future, based on the current forecast for development projects in the ROI.

3.15.3 Identification of Past, Present, and Reasonably Foreseeable Future Actions

CEQ regulations specify that cumulative effects analyses encompass past, present, and reasonably foreseeable future actions. Actions considered in this cumulative effects analysis are identified in Table 3.15-1. As a practical matter, the impacts of past actions are already reflected in the Affected Environment section discussions for each resource area. Nevertheless, several past actions have occurred that could contribute to cumulative effects and whose impacts are not reflected in the baseline described in the Affected Environment section of each resource area. As a result, these additional past actions are included in the cumulative effects analysis and are identified in Table 3.15-1. Present and reasonably foreseeable future actions are considered to be those that currently exist or are under construction, are the subject of an existing plan or proposal, or have identified funding.

Table 3.15-1. Past, Present, and Reasonably Foreseeable Projects within the Cumulative Effects Analysis Area

Project Title	Proponent	Location	Timeframe	Project Description
On-Installation Project				
Past Actions				
Disposition of Hangars 2 and 3	USAG Fort Wainwright	Fort Wainwright, Alaska	Past 2013–2016	This project involved demolition of two historic World War II-era hangars at Fort Wainwright. An EIS addressing this project also looked at other disposition options and a No Action Alternative. Both buildings have been found to be unsafe for occupancy and have no remaining military purpose. The hangars were contributing resources within the Ladd Field NHL and Ladd AFB CWHD. All other impacts would be less than significant. Mitigation measures were implemented to minimize adverse impacts on cultural resources (USAG Fort Wainwright 2013a).
Present and Future Actions				
Fort Wainwright Area Development Planning Projects	USAG Fort Wainwright	Fort Wainwright Alaska	Present Future 2017–2042	Fort Wainwright's 2016 ADPs for the Chena District, North Post District, South Post District, Ladd Airfield District, and the West Post District identified 40 short-range (0–5 year) projects that would demolish aged facilities and infrastructure, construct and renovate several facilities, and implement many roadway improvements across the installation (USACE 2015, 2016a, 2016b, 2016c, 2017b). Mid-range (6–15 years) and long-range (16–25 years) plans in these installation areas would implement up to 98 additional construction, demolition, and transportation improvement projects. At full build-out (estimated by 2042), these short-, mid-, and long-range plans would demolish approximately 10 million square feet of developed area, and construct approximately 4 million square feet of new facilities and improved roads, and pedestrian improvements across the installation. The *Real Property Master Plan Programmatic Environmental Assessment* (EA) addressed the less than significant environmental impacts anticipated from implementation of these plans; the Finding of No Significant Impact (FNSI) was signed in May 2017 (USAG Fort Wainwright 2017a).

Project Title	Proponent	Location	Timeframe	Project Description
Stationing the Gray Eagle Unmanned Aircraft System (UAS)	USAG Fort Wainwright	Fort Wainwright, Alaska	Present Recent Past	This project expanded infrastructure and facilities to support the stationing and operation of the Gray Eagle UAS at Fort Wainwright, Alaska (USAG Fort Wainwright 2015). This project was implemented to provide the necessary airfield and support facilities for the 25th Aviation Regiment Company D to operate the Gray Eagle UAS in Interior Alaska within existing restricted airspace. An EA addressed the action, and the FNSI was signed in 2015.
Off-Installation Projects				
Past Actions				
New Mission Beddown and Construction at Clear Air Force Station (AFS)	U.S. Air Force (USAF), Clear AFS	Clear AFS, Alaska	Past 2013–2016	This project implemented new mission requirements and upgraded the Early Warning Radar and associated facilities at the Solid State Phased-Array Radar System at Clear AFS (Missile Defense Agency [MDA], 2012). An EA that addressed the project was prepared in 2012. The projects were implemented from FY 13 through FY 16.
Present and Future Actions				
Fairbanks International Airport Master Plan	FAI	FAI	Present Future 2019 and beyond	This plan is a comprehensive study of the FAI that compares existing and forecasted aviation demand with existing conditions and facilities to identify the need for future development (ADOT&PF 2019b). The plan describes near-, mid- and, long-term development plans and identifies the triggers necessary to begin those projects. This framework cost-effectively guides airport development while also considering potential environmental, airspace use, and socioeconomic impacts.

Project Title	Proponent	Location	Timeframe	Project Description
Fairbanks Area Rail Line Relocation Project	ARRC	ARRC Eielson Branch, North Pole, Alaska	Present Future Phase I: 2013–2015 Phases II and III: to be determined	This three-phased-project proposes phased construction of several rail crossings across the FNSB to reduce traffic conflicts and decrease travel times through the region. Phase I, planned to start construction in 2013, would realign the existing Eielson Branch of the rail line along a southwest route between Moose Creek and Richardson Highway at Milepost 9. Phases II and III would add rail lines from Richardson Highway Milepost 9 to 3-Mile Gate near Fort Wainwright, and from 3-Mile Gate to beyond Chena, respectively. An EA addressing the impacts from this project was completed in 2012, and the FNSI was signed in 2013. In 2018, ADOT&PF and the Fairbanks Metropolitan Area Transportation System (FMATS) identified that subsequent rail realignment and relocation phases are still in the planning and design stages. Construction timeframes for those efforts are not yet determined (ADOT&PF and FMATS 2019). In 2019, FMATS transitioned to the non-profit Fairbanks Area Surface Transportation (FAST) Planning organization.
Alaska LNG Pipeline	Alaska Gasline Development Corporation (AGDC)	Various, Alaska	Future Estimated construction: 2021–2029 Estimated operation: 2030–2060	AGDC submitted an application to the Federal Energy Regulatory Commission (FERC) requesting approval of the construction and operation of an LNG pipeline and liquefaction facility pursuant to Section 3 of the Natural Gas Act and Part 153 of the Commission's regulations. Specifically, AGDC is seeking authorization to construct and operate a new gas treatment plant; a 1-mile, 60-inch Prudhoe Bay Unit gas transmission line; a 63-mile, 32-inch Point Thomson Unit gas transmission line; an 807-mile, 42-inch natural gas pipeline (mainline pipeline) and associated aboveground facilities; and a 20 million-metric-ton-per-year liquefaction facility near Cook Inlet in Alaska. The anticipated construction timeline for this project would be the 8 years following the publication date for the signed ROD. The project would have an annual average inlet design capacity of up to 3.7 billion standard cubic feet per day and a 3.9 billion standard cubic feet per day peak capacity. AGDC states that the project would have a nominal design life of 30 years. In June 2018, FERC prepared and released a Draft EIS that disclosed project details and anticipated significant adverse impacts on permafrost, biological resources, air quality, and noise; less than significant impacts on housing and environmental justice communities; and beneficial impacts on state and local economies (FERC 2018).

Project Title	Proponent	Location	Timeframe	Project Description
Fairbanks North-Star Borough Regional Growth Plan	FNSB	Fairbanks, Alaska	Present Future 2018 and beyond	An FNSB planning document provides the foundation for future growth coupled with responsible stewardship of major attributes of the community (FNSB 2018b). It provides the framework for citizens and officials to make decisions related to land use, and to form the basis for ordinances and programs to guide land use and development. The document is also a guide for responding to change in the community. It details the vision that will guide FNSB through the next few decades. Goals, strategies, and actions are provided to implement the vision. Near future development in FNSB is focused on substantial expansions in housing and infrastructure to accommodate the F-35 beddown at Eielson AFB.
Northern Region Transportation Improvement Projects	ADOT&PF and FAST Planning (formerly FMATS)	Fairbanks, Alaska	Present Future 2019–2030	ADOT&PF identified 146 transportation improvement projects in and around the Fairbanks community (ADOT&PF 2019c). Projects range from upgrading signage to reconstruction of roads and culverts, and include repaving roadways, road construction, upgraded signalization, development of pedestrian and bicycle paths, bus stops, bus stop shelters, sidewalks, facility reconstruction or replacement of roads and bridges, intersection improvements, and upgrades for improved security controls. Approximately 60 percent of the projects on this list are currently being constructed, 25 percent are still in design, 10 percent are in planning, and 5 percent are in the pre-planning stage.
BLM Resource Management Plans for Fortymile, Steese, Draanjik, and the White Mountains	BLM	BLM-managed lands at Fortymile, Steese, Draanjik, and the White Mountains, Alaska	Present Future 2017 and beyond	In 2016, BLM proposed implementation of a Proposed Resource Management Plan (that would provide a framework for the future management direction and appropriate use of the Eastern Interior Planning Area, located in Interior Alaska. The document contains both land use planning decisions and implementation decisions to guide BLM management of the four planning subunits: Fortymile, Steese, Upper Black River (Draanjik), and the White Mountains. An EIS was prepared for this action in July 2016 (BLM 2016). BLM approved the plans and issued RODs for the planning areas in January 2017 (BLM 2017).

Project Title	Proponent	Location	Timeframe	Project Description
F-35A Beddown at Eielson AFB	USAF	Eielson AFB, Alaska	Present Future 2019 and beyond	The USAF proposes to bed down operational F-35A squadrons (Ops #2) in the Pacific Air Forces Area of Responsibility (PACAF AOR), arriving at this decision through a deliberative process. The proposed action would base up to 54 F-35A aircraft (or 48 Primary Assigned Aircraft and 6 Backup Aircraft Inventory) within the PACAF AOR, specifically at Eielson AFB. The proposal also includes approximately 3,300 additional military and civilian personnel and construction and/or modification of facilities for aircraft maintenance and operation. The beddown was projected to bring more than 2,600 jobs in the area. An EIS was prepared to address impacts anticipated from the project in 2016. The ROD was signed in April 2016. Initial construction in the Fairbanks area to support the F-35 beddown at Eielson AFB was anticipated to begin in spring 2017 and the first aircraft were projected to arrive in 2019 with full operations occurring by 2021. USAF prepared a supplemental EIS and ROD in 2017 to address changes in facility and infrastructure improvements required on the installation to prepare for the F-35 beddown (83 *Federal Register* 1611).

3.15.4 Cumulative Effects under the Proposed Action

3.15.4.1 Air Quality

No significant cumulative impacts on air quality would be expected from implementation of the Proposed Action concurrently with the other identified cumulative projects within the ROI. The Proposed Action and other identified cumulative projects would result in cumulative, short-term, minor, air emissions from construction vehicles, equipment, vehicle transport of materials and workers to and from the various development sites, and the demolition and construction activities that would be conducted for each project. These impacts would be limited to the individual project sites, would result in minor amounts of criteria pollutants and GHG being released from vehicles and equipment during the construction activities associated with Alternative 1. Because these impacts would be short term and localized in nature, they are not anticipated to significantly affect the air quality in the Fairbanks area. Further, most construction emissions would occur during the warmer seasons, whereas the $PM_{2.5}$ nonattainment status in Fairbanks is primarily a wintertime issue. Design and construction measures would be implemented to reduce air emissions impacts during construction for the planned projects considered in this analysis.

Operation of the Proposed Action would contribute minor, beneficial impacts on the overall, cumulative, beneficial reduction in operational air emissions in the region through replacement of the existing CHPP and other aged facilities and technologies with modern, resource-efficient buildings and operating systems.

3.15.4.2 Utilities

If constructed and operated concurrently with the other identified on- and off-installation cumulative projects, the Proposed Action would contribute to cumulative, short-term, minor, adverse impacts on utilities from temporary disruptions to service as new facilities and infrastructure were incorporated and became operational. On Fort Wainwright, the Proposed Action and ADPs would cumulatively result in long-term, moderate, beneficial impacts on utilities and infrastructure from removal of aged facilities and construction and operation of modern, resource efficient buildings and systems.

Depending on the alternative selected to implement the Proposed Action, the project could contribute negligible to minor, adverse impacts on electricity, liquid fuels, water, wastewater, and solid waste management. If one of the natural gas-fueled action alternatives is selected to implement the Proposed Action, the project would contribute with other cumulative projects (e.g., Alaska LNG pipeline project, Fairbanks comprehensive development actions, and FNSB regional growth) to long-term expansion of the natural gas utility in the Interior Alaska region and the state.

3.15.4.3 Hazardous and Toxic Materials and Wastes

The Proposed Action and other identified cumulative development actions (ADP-related demolitions and construction projects) on the installation would result in cumulative, short-term, minor, adverse impacts from generation of ACM, LBP, and PCB-contaminated materials and construction debris. Additionally, construction for the Proposed Action and other identified on-installation cumulative projects could contribute to short- and long-term, minor, adverse impacts from disturbance of contaminated soils and increased potential for impacts on groundwater. Avoidance and minimization measures would be implemented to reduce potential for these effects.

If a natural gas-fueled action alternative is selected to implement the Proposed Action, the project would contribute with other natural gas utility expansion actions in the region to the increased potential for cumulative, short- and long-term, minor, and adverse impacts associated with fuel spills and low-probability pipeline leaks. Design measures would be incorporated to avoid or minimize the potential for such effects. Although a natural gas-fueled alternative would contribute to cumulative, long-term, beneficial impacts on hazardous waste management from removal and treatment of the on-installation coal ash yard, such an alternative would contribute to cumulative, long-term, minor, adverse impacts from generation of a new hazardous waste stream composed of the natural gas and ULSD combustion products.

3.15.4.4 Socioeconomics

Cumulatively, the Proposed Action and other cumulative projects would result in short-and long-term, negligible, adverse impacts and short- and long-term, negligible to minor, beneficial impacts on socioeconomics in and around Fairbanks. During construction, the Proposed Action and other cumulative projects would contribute to minor, beneficial impacts on the local economy from the purchase of materials, goods, and services, and to increased employment and taxes associated with construction. Depending on the alternative selected for implementation of the Proposed Action, construction of the new heating system could contribute to cumulative, moderate, increases in temporary construction-related jobs in the region. Worker relocations to support the various cumulative projects, including the Proposed Action, would result in temporary, minor, adverse impacts on population and housing. Any employment and construction spending associated with the Proposed Action and other cumulative projects would provide taxable income to the local and state governments. Local businesses would be expected to benefit from spending by construction personnel associated with these development actions.

If a non-coal-fueled alternative is selected for implementation, the Proposed Action could cumulatively contribute to long-term, moderate, and adverse impacts on coal-related business revenues and jobs in the region, especially in Healy, where coal is mined and transported coal for the existing CHPP on the installation. Additionally, the transition from coal to natural gas for such a selection would contribute to cumulative, near-term, minor adverse impacts on residential communities from utility rate changes.

Short-term, negligible, adverse impacts on socioeconomics could result from blocked accesses that may be required to accommodate the Proposed Action. Although additional travel time and distances resulting from construction detours and changed accesses may be necessary for drivers to reach their intended destinations, access would be maintained to nearby businesses on and off the installation. Cumulative impacts from these changes on local businesses would be temporary and negligible during construction. If additional property would be required to support utility infrastructure and establishment of a right-of-way, property owners would be fairly compensated. If required, loss of private land from right-of-way acquisition could negligibly decrease the tax base, causing local jurisdictions to lose a small portion of their property tax revenues.

3.15.4.5 Environmental Justice

Construction of the Proposed Action would contribute to short-term, cumulative, minor, and adverse impacts on local communities including environmental justice and child populations within the ROI. These impacts would include increased noise, construction vehicle and equipment emissions, increased traffic levels, and presence of construction work sites and associated hazards. Measures would be implemented to dampen construction noise and air emissions during construction activities, reduce construction traffic during peak driving times, and safeguard the public from active work sites. Cumulative short-term (temporary), minor to moderate, beneficial cumulative impacts from construction-related employment opportunities would be expected.

If Alternative 1 (new coal-fueled CHPP) is selected to implement the Proposed Action, operation of the resulting facility would contribute long-term, disproportionately high and adverse health impacts (e.g., emissions from coal combustion and from continued operation of the coal ash handling and disposal system) to the cumulative impacts on environmental justice communities in the ROI. Considered cumulatively, operation of additional aircraft, vehicles, heating of additional homes, buildings, and facilities associated with the beddown of the F35 at Eielson AFB, and overall population growth in the Fairbanks region would also contribute to increased air emissions. It is possible that regional measures proposed to reduce and control air emissions (e.g., home and facility heating advancements, transition in fuel usage to natural gas, and transportation upgrades to minimize idling and delays on roadways) would help to offset some of these impacts.

If Alternative 2 (dual-fueled natural gas/ULSD CHPP) or Alternative 3 (distributed natural gas boiler system) is selected to implement the Proposed Action, operation of the resulting facility would contribute long-term, locally disproportionately high and adverse economic impacts from the ceased requirement for and purchase of coal from a local coal provider, which would likely result in job losses in low-income positions providing services in Healy. It is also likely that adverse socioeconomic impacts from increased utility rates associated with the transition from coal to natural gas may contribute to cumulative impacts on low-income residential communities in Fairbanks, but expansion of natural gas infrastructure to the installation might allow for growth of similar infrastructure in the greater Fairbanks area, potentially offering a utility option in the future at a comparable or lower cost.

Cumulative, long-term, minor, beneficial health and economic impacts on environmental justice populations would also be anticipated from the Proposed Action and other identified cumulative projects from operation of modern, technologically-advanced, and resource-efficient facilities; expanded and upgraded utilities and infrastructure; residential, commercial, and transportation growth and improvements; and increased job opportunities.

3.15.4.6 Noise

Cumulatively, construction activities for the Proposed Action and the other identified on- and off-installation cumulative projects would produce elevated noise levels from construction vehicles transporting workers and materials to and from work sites and from operation of construction equipment at the various development phases for each project. Noise impacts would be greatest where concurrent construction actions are being conducted in close locations. These impacts could be minor to moderate and adverse, but would be temporary, lasting only the duration of overlap of the different construction activities. It is possible that if the Proposed Action and other identified cumulative projects are constructed in the same areas, noise from construction vehicles and operation of equipment associated with these projects may be audible to nearby noise-sensitive receptors (residences and recreation areas) on and off the installation. Construction noise abatement measures (e.g., use of muffler systems and appropriately spacing noise-generating equipment away from noise-sensitive receptors) would further minimize such short-term noise impacts. Community notifications and ensuring construction plans and specifications are in accordance with local ordinances would also minimize these noise impacts.

If one of the action alternatives is selected for implementation, operation of the new heating system for the Proposed Action would not be expected to contribute greater than negligible, long-term adverse impacts on the ambient sound environment.

3.15.4.7 Land Use

The Proposed Action and other identified cumulative projects would result in cumulative, short-term, minor, adverse impacts on land use on Fort Wainwright and the surrounding communities in FNSB from increased traffic, increased noise, temporarily increased commute times, detours, delayed access to facilities, and temporarily changed viewsheds from the presence of construction equipment and activities.

If a natural gas-fueled alternative is selected to implement the Proposed Action, short-term on-post land use incompatibilities (delayed access, increased construction noise, reduced air quality) during construction of the underground pipeline would result if routed through non-industrial areas (e.g., natural or residential areas). These impacts would be minor and would contribute to cumulative, short-term, minor to moderate, adverse impacts on land use during the construction efforts required for other on- and off-installation cumulative development projects.

Operation of a new coal-fueled CHPP would not contribute to long-term cumulative impacts on land use because the new plant would be located immediately adjacent to the existing CHPP in the industrial area; this siting would be considered a continuation of existing land use.

Operation of a new dual-fueled natural-gas/ULSD CHPP (Alternative 2) or a distributed natural gas boiler facility (Alternative 3) would result in long-term, minor to moderate, adverse impacts on land use at Fort Wainwright and FNSB from utility right-of-way property acquisitions or easements and use of corridors for proposed pipelines, if needed. Long-term, minor, beneficial impacts on visual resources and viewsheds from removal of the existing CHPP and the coal stockpile and from restoration of the area to a more visually aesthetic area. These changes would also include the cessation of rail deliveries of coal. Consequently, cumulative impacts from the Proposed Action and other identified on- and off-installation cumulative development projects (Fort Wainwright ADPs and regional growth anticipated in the FNSB and Fairbanks plans) would result in cumulative, long-term, minor to moderate, beneficial impacts on land use from removal of aged facilities and infrastructure, optimized development and land use efficiency, and improved capacities to support the ongoing USAG missions.

3.15.4.8 Transportation and Traffic

The Proposed Action, Fort Wainwright ADPs, transportation improvement projects planned by ADOT&PF and Fairbanks Area Surface Transportation (FAST) Planning, and other identified cumulative development and regional growth actions would contribute to cumulative short-term, moderate, adverse impacts on transportation from the presence of construction actions on and along roadways. These temporary impacts would be minimized by positioning flaggers at construction sites, maintaining open lanes where possible, maintaining construction parking and storage of project-related materials at the project site, and ensuring the construction commutes to and from the work sites avoid peak commuting, entry, and exit times onto the installation.

Long-term, operation of the Proposed Action would not contribute to cumulative impacts on traffic and transportation.

3.15.4.9 Human Health and Safety

Construction activities associated with the Proposed Action and other cumulative development and infrastructure projects would have localized, short-term, adverse impacts on health and safety resulting from a heightened risk of traffic, presence of multiple work zones across the installation and throughout the surrounding communities, and daily operations-related incidents. Localized, cumulative, long-term, minor to moderate, beneficial impacts on health and safety resulting from facility modernization would be associated with the Proposed Action and other cumulative projects.

The Proposed Action (under Alternative 1) would contribute long-term, minor to moderate, adverse impacts on health and safety from ongoing coal plant emissions and use of the coal ash handling facility. If Alternative 2 or Alternative 3 were selected to implement the Proposed Action, potential contribution to cumulative adverse impacts (e.g., low-probability leaks or spills) would be reduced through implementation of design and construction measures and BMPs. With implementation of installation SOPs and adherence to existing safety standards for pipeline operation, the anticipated cumulative impacts would be minor.

Implementing ADPs and any one of the alternatives of the Proposed Action would result in cumulative, long-term, minor to moderate, beneficial impacts on health and safety on the installation. Replacing aged facilities and infrastructure with modern, technologically-advanced facilities and systems would substantially reduce the risks of an installation-wide winter evacuation. Together, the on-installation cumulative projects would also contribute to beneficial impacts by providing greater reliability against loss of heat and power. Operation of the Proposed Action would not contribute to off-installation cumulative impacts on health and safety.

3.15.4.10 Geology and Soil Resources

The Proposed Action and other identified cumulative development projects would result in cumulative, short-term, minor, adverse impacts (soil compaction and erosion) from construction activities (grading, scrubbing, and site preparation). If constructed concurrently and near contaminated sites, the Proposed Action and Fort Wainwright ADP projects could disturb contaminated soils, resulting in cumulative, minor, adverse impacts on soil resources on the installation. Optimized facility siting to avoid development in contaminated areas and implementation of construction measures to avoid contaminated sites would minimize potential for such impacts.

Long-term, operation of the Proposed Action would not be expected to contribute to cumulative impacts on geology or soil resources.

3.15.4.11 Water Resources

The Proposed Action and other identified cumulative projects would result in short- and long-term minor adverse impacts on surface waters and water quality from increased impervious surface area and potential to disturb contaminated soils, increased storm water runoff, and sedimentation. Optimized project siting to avoid contaminated areas and development and adherence to the installation's stormwater management policies and SWPPPs of each project would be expected to reduce potential for these impacts.

The Proposed Action (under Alternatives 2 or 3) would also contribute added long-term risk for a low-probability fuel transport accident or pipeline leak or spill that would affect water resources. Adherence to existing fuel transport regulations and requirements and implementation of design measures for natural gas pipelines would minimize the potential for these impacts to occur, and would therefore minimize potential for contribution to cumulative impacts on water resources.

3.15.4.12 Cultural Resources

The Proposed Action would not contribute to cumulative impacts on archeological resources. The Proposed Action would be unlikely to contribute to any cumulative off-installation impacts on cultural or historical resources.

Under the Proposed Action and ADP-related development actions on Fort Wainwright, depending on where new infrastructure would be constructed, modification or discontinued use of the utilidor system could contribute to minor to significant cumulative adverse impacts on historic properties (e.g., Ladd Field NHL, Ladd AFB CWHD) and contributing resources, which would be addressed by mitigation identified through the Section 106 process.

3.15.4.13 Airspace Management

The Proposed Action would not contribute to cumulative impacts on airspace management.

3.16 Summary of Environmental Impacts and Avoidance, Minimization, and Mitigation Measures

A summary of potential impacts from the construction, operation, maintenance, and emergency repairs associated with the proposed CHPP project and the No Action Alternative are presented in the following resource area discussions and summarized in Table 3.16-1. The full impact analysis, along with proposed avoidance and minimization measures and BMPs to avoid or reduce potential impacts on resources, is presented in the individual resource and cumulative impacts analyses in Chapter 3.

3.16.1 Unavoidable Adverse Impacts

The environmental analysis of the alternatives provided in Sections 3.2 through 3.14 includes the avoidance, minimization, or other mitigation of potential adverse effects on natural, cultural, and environmental resources; however, all adverse impacts may not be completely avoided and/or mitigated.

Unavoidable adverse impacts would result from implementation of the Proposed Action. Unavoidable adverse impacts during construction include increases in water turbidity; disturbance of sediments; noise from construction; localized habitat degradation; soil disturbance and erosion; stormwater runoff into surface water; and increased traffic, air emissions, and noise associated with construction vehicles and activities. Once operational, the Proposed Action could generate unavoidable adverse impacts similar to those occurring during construction, although to a lesser extent. These impacts would also likely be confined to the immediate area of disturbance. Adverse impacts would be minimized to the extent possible through implementation of the avoidance, minimization, and mitigation measures identified in Section 3.16.2.

Table 3.16-1. Summary of Environmental Impacts

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Air Quality Section 3.2	Short-term, minor, adverse impacts during repairs Long-term (during operations),[a] minor, beneficial impacts: • Reduces 1 criterion pollutant emission level due to implementation of BACT measures	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: • Reduces 8 criteria pollutant emissions levels • 30 percent less water vapor	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: • Reduces 7 criteria pollutant emissions levels • Greater decrease for most pollutants than under Alternative 1 • 32 percent less water vapor	Short-term, minor, adverse impacts during construction Long-term, moderate, beneficial impacts: • Reduces 8 criteria pollutant emissions levels • Substantial decrease in levels for most pollutants • 60 percent less water vapor
Utilities Section 3.3	Short-term, minor, adverse impacts during repairs No impact on coal consumption or heating efficiency: • 42 percent efficient system Long-term, significant, adverse impacts on Fort Wainwright's mission could occur from continued risk of plant failure No change in long-term impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency: • 53 percent efficient system • Less coal consumption Long-term, minor, adverse impact on coal consumption and ash disposal operations Long-term, significant, beneficial impacts on mission support Long-term, moderate, beneficial impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency • 58 percent efficient system • No coal consumption • Cleaner-burning than coal Long-term, moderate, adverse and beneficial impacts on natural gas and ULSD fuel consumption Long-term, significant, beneficial impacts on mission support Long-term, moderate, beneficial impacts on electrical system	Short-term, minor, adverse impacts during construction Long-term, significant, beneficial impacts on heating efficiency: • 75 percent efficient system • No coal consumption • Cleaner-burning than coal Long-term, moderate, adverse and beneficial impacts on natural gas and ULSD fuel consumption Long-term, significant, beneficial impacts on mission support Long-term increased reliance on off-post electricity adds minor risk

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Hazardous and Toxic Materials and Wastes Section 3.4	Short-term, minor, adverse impacts during repairs Long-term, minor, adverse impacts from coal waste stream and ongoing repairs	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction Long-term, minor, adverse impacts from coal ash waste stream	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction Long-term, negligible, adverse impacts from new waste stream Long-term, moderate, beneficial impacts from closure/remediation of on-post coal supply site	Short-term, minor, adverse impacts from use of hazardous materials, and waste generated during construction; potential to disrupt MMRP, IRP, or UXO sites during construction Long-term, negligible, adverse impacts from new waste stream Long-term, moderate, beneficial impacts from closure/remediation of on-post coal supply site
Socio-economics Section 3.5	Short-term, minor, beneficial impacts during repairs: • Temporary local jobs during ongoing repairs No cost of living impacts Long-term, minor to moderate, adverse impacts on employment and income from rising costs and operating at reduced capacity	Short-term, minor, beneficial impacts from construction: • 2,700 temporary jobs • $183 million labor income • $287 million business sales No cost of living impacts Long-term, moderate, adverse and beneficial impacts on workforce during operation: • $3.9 million labor income • $20.5 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, moderate, adverse impact on coal demand due to improved system efficiency	Short-term, minor, beneficial impacts from construction: • 1,700 temporary jobs • $121 million labor income • $287 million business sales Near-term utility rate increase Long-term, minor to moderate, adverse and beneficial impacts on workforce during operation: • $2.8 million labor income • $13.8 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, significant, localized adverse impact on coal demand Long-term, minor, beneficial impacts on natural gas sector	Short-term, minor, beneficial impacts from construction: • 500 temporary jobs • $42 million labor income • $103 million business sales Near-term utility rate increase Long-term, minor to moderate, adverse and beneficial impacts on workforce during operation: • $1.1 million labor income • $2.4 million in business sales • May require fewer direct jobs than No Action Alternative Long-term, significant, localized adverse impact on coal demand Long-term, minor, beneficial impact on natural gas and electrical utility sectors

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Environmental Justice Section 3.6	Short-term, minor, adverse impacts during repairs Long-term, minor to moderate, adverse health impacts: coal use and combustion, especially on child populations Long-term, moderate to significant, adverse impacts on mental and physical health for Fort Wainwright population if system fails during winter	Short-term, minor, adverse impacts (noise, traffic) Long-term, minor, beneficial impacts (improved air quality) Long-term, minor to moderate, adverse health impacts: coal use and combustion, similar to No Action Alternative	Short-term, minor, adverse impacts, similar to Alternative 1 Long-term, minor, beneficial health impacts due to reduced emissions Long-term, significant, localized adverse economic impacts low-income populations in Healy from less coal demand	Short-term, minor, adverse impacts, similar to Alternative 1 Long-term, minor, beneficial health impacts due to reduced emissions Long-term, significant, localized adverse economic impacts low-income populations in Healy from less coal demand
Noise Section 3.7	Short-term, minor, adverse impacts during repairs No long-term changes to noise as compared to existing conditions	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise than existing CHPP	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise and rail deliveries of coal would cease	Short-term, minor, adverse impacts during construction Long-term, minor, beneficial impacts: new infrastructure may generate less noise and rail deliveries of coal would cease
Land Use Section 3.8	No short- or long-term changes on land use or visual resources	Long-term, minor, beneficial impacts on visual resources from new CHPP	Long-term, minor, beneficial impacts on visual resources, and minor to moderate, adverse impacts from pipeline construction	Long-term, minor, beneficial impacts on visual resources, and minor to moderate adverse impacts from pipeline construction
Transportation and Traffic Section 3.9	Short-term, minor, adverse impacts during repairs No long-term changes to existing conditions – coal deliveries by rail and coal ash by truck would continue	Short-term, minor, adverse impacts during construction No long-term changes to existing conditions – coal deliveries by rail and coal ash by truck would continue	Short-term, minor, adverse impacts during construction Long-term, negligible to minor, beneficial impacts, no coal deliveries and less truck traffic Long-term, negligible to minor, adverse impacts from natural gas and ULSD truck delivers	Short-term, minor, adverse impacts during construction Long-term, negligible to minor, beneficial impacts, no coal deliveries and less truck traffic Long-term, negligible to minor, adverse impacts from natural gas and ULSD truck delivery

Resource Area EIS Section	**No Action Alternative**	**Alternative 1 (Build a New Coal CHPP)**	**Alternative 2 (Build New Dual-Fuel Combustion Turbine Generator CHPP)**	**Alternative 3 (Install Distributed Natural Gas Boilers)**
Human Health and Safety Section 3.10	Short-term, minor, adverse impacts during repairs Long-term, moderate to significant, adverse impacts on health by not reducing risk of outage; perpetuates safety risks Continues coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Continues coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Avoids coal use	Short-term, minor, adverse impacts during construction Long-term, minor to moderate, beneficial impacts, substantially reduces risk of installation evacuations from outage Avoids coal use
Geology and Soil Resources Section 3.11	Short-term, negligible to minor, adverse impacts during repairs	Short-term, negligible to minor, adverse impacts during construction	Short-term, negligible to minor, adverse impacts during construction	Short-term, negligible to minor, adverse impacts during construction
Water Resources Section 3.12	Short-term, negligible to minor, adverse impacts on water quality during repair work No long-term, adverse impacts on water resources	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater	Short-term, negligible to minor, adverse impacts on water quality during construction Long-term, negligible, adverse impacts on groundwater
Cultural Resources Section 3.13	No long-term, adverse impacts on cultural resources	Long-term, minor, adverse impacts on Ladd Field NHL from utilidor upgrades; would be less than significant with mitigation Long-term, minor, adverse impact on viewshed of distant historic properties No impacts on archaeological resources	Long-term, minor, adverse impacts on Ladd Field NHL from utilidor upgrades; would be less than significant with mitigation Long-term, minor, adverse impact on viewshed of distant historic properties No impacts on archaeological resources	Long-term, significant, adverse impacts on Ladd Field NHL and Ladd AFB CWHD from construction of facilities near historic resources, and on Ladd Field NHL from utilidor upgrades; would be less than significant with mitigation No impacts on archaeological resources
Airspace Section 3.14	No impact on airspace management	No impact on airspace management	No impact on airspace management	No impact on airspace management

Note:

[a] Long-term refers to the operation period (i.e., after initial construction for action alternatives).

3.16.2 Applicable Avoidance, Minimization, and Mitigation Measures

The following subsections list the measures identified for each resource in consideration of existing regulations and resource conditions and anticipated impacts from implementing the proposed project (see Sections 3.2 through 3.14). Final mitigation requirements by USAG Alaska are based on the requirements of its regulations and the mitigation's adequacy and practicability to offset impacts on aquatic resources as a result of project construction that would be authorized by USAG at Fort Wainwright. Monitoring requirements for mitigation would be established as permit conditions.

3.16.2.1 Air Quality

Design and Construction Measures

- As available, newer model construction equipment would be used to minimize engine emissions.
- Exposed disturbed areas and material storage piles would be watered as needed to minimize wind generated dust.
- Facility roads would be watered and/or swept as needed to remove material tracked onto roadways and to minimize dust emissions from vehicle movement.
- Trucks hauling wind-erodible materials would be covered.

BMPs

- Compliance with all requirements of the ADEC-issued air permit would be maintained.
- Routine maintenance and tuning of combustion equipment would be provided.
- Routine training of equipment operators and maintenance personnel would be conducted.
- Equipment manufacturer recommended procedures for minimizing emissions would be followed.

3.16.2.2 Utilities

Design and Construction Measures

- For construction and operation of a coal-fired CHPP (Alternative 1):
  - At minimum, a 14-day supply of coal would be stored on the installation; however, the actual supply of coal would likely be similar to current practice, which is typically a 90-day supply.
  - Emergency electricity generators would be installed in mission-critical facilities across the installation so that mission operations would be sustained during potential outages of electricity from both CHPP and local service provider sources.

- For construction and operation of a natural gas pipeline (Alternatives 2 and 3):
  - Construction of the natural gas supply pipeline to Fort Wainwright would be coordinated with existing utilities to ensure placement does not conflict with existing utility services.
  - ULSD would be used if a natural gas service failure occurred. ULSD could be used exclusively, if needed. ULSD might be used exclusively if natural gas service if not available for Fort Wainwright when the CHPP is commissioned.
  - Sufficient ULSD storage capacity would be constructed on Fort Wainwright to sustain at least 14 days of uninterrupted operations.
- Emergency electricity generators would be installed in mission-critical facilities across the installation so that mission operations would be sustained during potential outages of electricity.
- Inform contractor(s) of utility locations before ground-disturbing activities to minimize the potential for utility disruptions and/or human safety hazards.

3.16.2.3 Hazardous and Toxic Materials and Wastes

Design and Construction Measures

- A Project-specific Construction Spill Control and Waste Management Plan would be developed and adhered to during construction and an SPCC Plan would be developed and adhered to during operation to minimize potential impacts associated with an inadvertent spill or leak of fuel or other hazardous material. Key aspects of these plans include monitoring storage and refueling activities, provisions for secondary containment around bulk storage of hazardous materials, and the immediate response and cleanup if a spill or leak occurs.
- Construction workers would handle and dispose of any ACM, LBP, and PCBs in accordance with existing regulations.
- For construction actions occurring near remedial sites, USAG Alaska would implement sampling analysis and work plans as required before any ground disturbance to identify and address any current or historical contamination. Remedial actions would continue in accordance with CERCLA regulations for these active sites.
- If pipeline construction is required (Alternatives 2 and 3):
  - Road or rail transport of natural gas to the installation would be conducted in accordance with DOT safety guidelines for the transport and handling of hazardous materials.
  - Risk of long-term groundwater contamination from pipeline leaks would be minimized through implementation of design specifications and BMPs.

  - Construction of a natural gas pipeline would be completed in accordance with existing safety standards, and the unlikely risk of leakage or a fuel spill would be handled in accordance with the SPCC Plan.

- Known contaminated sites would be avoided, to the extent possible, during transportation of natural gas or construction of a natural gas pipeline to the installation. If known contaminated sites could not be avoided along the potential natural gas pipeline route, remediation efforts would be conducted in accordance with the applicable CERCLA, ADEC, and RCRA regulations to minimize further contamination.

3.16.2.4 Socioeconomics

Construction Measure

- To the extent practicable, the construction workforce and required construction materials would be locally sourced.

3.16.2.5 Environmental Justice

BMPs

- Applicable BMPs and measures for other resource areas such as air quality, noise, and human health and safety would help reduce impacts on environmental justice populations.
- The public would be notified when project construction is expected to begin.

3.16.2.6 Noise

Construction and Operation Measures and BMPs

- Heavy equipment use would primarily occur during normal weekday business hours, typically from 8 a.m. to 6 p.m.
- All heavy construction equipment would include noise abatement components such as mufflers, engine enclosures, engine vibration isolators, and other sound dampening supplements.
- Heavy equipment mufflers would be properly maintained and in good working order.
- Personnel, particularly equipment operators, would use adequate PPE to limit exposure and ensure compliance with federal health and safety regulations.
- All idling equipment would be turned off when not in use.
- Good relationships with the community would be maintained and notices would be published/distributed before noisy operations occur.
- The community would be provided with frequent updates about when and where construction actions occur.

3.16.2.7 Land Use

Design and Construction Measures

- Design and siting of a new heating facility would meet all anti-terrorism/force protection requirements and would decrease the current risk to life-safety and mission readiness.
- To avoid any land use conflicts, efforts would be made to site and construct all facility-related infrastructure in areas that would be compatible with surrounding land uses.
- Construction staging/laydown areas, materials and equipment storage areas, and demolition activities would be located within an industrial land use area, and would be confined to the project site to the extent practicable.
- If required, pipeline construction (under Alternatives 2 and 3) off the installation would be located within a zoning district designated for general use or industrial use by FNSB and possibly within an existing utility easement or right-of-way.
- If new right-of-way must be acquired or created, landowners would be provided financial compensation for providing the right to construct the pipeline on their properties and for future access to the properties to conduct maintenance and repairs.
- Land use restrictions on property within the easement and/or right-of-way would prevent the future development of the area.

3.16.2.8 Transportation and Traffic

Design and Construction Measures

- Project-related construction and utilidor upgrades would avoid work activities along or near roadways and rail lines to the extent possible.
- Construction workers would park on the site during construction activities, and the vehicles would use the ACPs outside of peak hours, to the extent practicable, to limit adverse impacts on traffic.
- Construction crews would minimize interference with non-construction traffic on roads selected for hauling materials to and from construction sites by the following:
    - Flaggers would be provided to guide traffic along the roadways near where construction activities are occurring.
    - Public notifications of construction actions that may affect traffic levels, temporary detours, or temporary road closures would be provided.

3.16.2.9 Human Health and Safety

Design and Construction Measures

- Design and construction of new habitable facilities at Fort Wainwright would comply with requirements set forth in UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings (DoD 2018c).
- All construction would be conducted in accordance with relevant regulations established by the USAG Alaska, Governmental Safety Requirements (Unified Facilities Guide Specifications, 01 35 26 [DoD 2019a]), OSHA, and other federal and state agencies.
- For Alternative 1, the modern coal-powered CHPP, coal ash would continue to be generated, loaded, transported, and disposed of at the Class I municipal solid waste landfill on Fort Wainwright.
- For Alternatives 2 and 3, transportation and pipeline distribution of natural gas would be managed in coordination with the local utility and in compliance with DOT Pipeline and Hazardous Materials Safety pipeline standards (49 CFR Part 192, Transportation of Natural and Other Gas by Pipeline – Minimum Federal Safety Standards.)

BMPs

- Construction sites would be accessible only to workers and authorized personnel, which would minimize risks to workers and passers-by.

3.16.2.10 Geology and Soils

Design Measure

- Earthquake risk would be mitigated by following standard engineering practices in evaluating foundation soils and incorporating seismic design.

BMPs

- The construction team would develop and adhere to a project-specific erosion and sediment control plan to minimize soil erosion.
- USAG Alaska would continue adherence to Fort Wainwright's existing SOPs for sediment and erosion control.

3.16.2.11 Water Resources

Design and Construction Measures

- Construction activities throughout the installation would comply with APDES storm water permitting requirements for construction.

- For construction activities occurring within the boundaries of the Fort Wainwright MS4, the installation would adhere to the requirement to ensure that construction and post-construction measures for erosion and sediment control BMPs are met.

BMPs

- The construction team would develop a project-specific SWPPP and adhere to Fort Wainwright's existing SWMP, which describes the minimum control measures necessary for storm water runoff control on a construction site and post-construction storm water drainage systems in the urbanized area of Fort Wainwright.

3.16.2.12 Cultural Resources

Design and Construction Measures

- All construction would be consistent with the guidance in two publications: *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (NPS 2017) and *FWA Aviation Stationing Mitigation: Design Guidelines for Ladd Field World War II National Historic Landmark, Fort Wainwright, Alaska* (Design Alaska 2012)
- Construction would be completed in coordination with Fort Wainwright's *Integrated Cultural Resources Management Plan* (USAG Alaska 2020b) and in accordance with specifications identified through the NHPA Section 106 consultation process.

3.16.2.13 Airspace Management

BMPs

- In accordance with FAA AC 150/5345-43J, Specification for Obstruction Lighting Equipment (FAA 2019), any potential flight obstructions or hazards created by tall structures would be equipped with aircraft warning lights and/or other appropriate aids to navigation.
- Fort Wainwright would continue to implement its standard aircraft de-icing program to reduce the potential for flight hazards associated with ice fog in the area.

3.17 Compatibility with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The Proposed Action would be a replacement of land use on the installation for the existing heating and electrical infrastructure (i.e., the CHPP) that would not result in changed land use designations or land use incompatibilities. The proposed project would be constructed and operated consistently with existing land use plans, policies, and controls as discussed in Section 3.8 and would not result in an intensification of land use in the surrounding areas. The long-term beneficial effects of constructing and operating the proposed heating and electrical infrastructure would support the Army's ongoing mission at Fort Wainwright as well as the Army's and DoD's long-term sustainability goals.

3.18 Relationship between Short-term Uses and Long-term Productivity

In accordance with NEPA (42 U.S.C. § 4321 Section 102[2][C][iv]), this section identifies the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity. Balancing the local short-term uses of the human environment with the maintenance and enhancement of long-term productivity (the natural environment) is an important consideration in determining project feasibility. This section discusses the short- and long-term effects, including benefits and losses that could be expected under the Proposed Action. Short-term uses of the biophysical components of the human environment include impacts, usually related to construction activities that occur during a period of less than 5 years. Long-term uses of the human environment include those impacts that occur during a period of more than 5 years, including permanent resource loss.

Sections 3.2 through 3.14 identify potential short-term, adverse impacts on the natural environment as a result of construction activities (between 2 and 3 years, depending on the selected alternative) of the proposed facility and supporting infrastructure. These adverse impacts include soil disturbance, erosion, and stormwater runoff into surface water and increased traffic, air emissions, and noise. Short-term employment and purchases of goods and services generated by the project could create a short-term, beneficial increase in the local economy that would end once construction is completed. These kinds of short-term impacts would persist only during occasional maintenance activities (e.g., vegetation management) and facility repair and upgrade activities. Adverse impacts would be minimized through implementation of avoidance, minimization, and mitigation measures identified for each alternative under each resource discussion in Sections 3.2 through 3.14.

Potential for long-term adverse impacts of the project include continued reliance upon non-renewable fuel sources, continued impacts on air quality from air emissions, potential for impacts on stormwater management from added impervious surfaces that would contribute to runoff and erosion, and continued landfill disposal of wastes on the installation.

The Proposed Action would be expected to promote long-term productivity by providing a modern, economical, and reliable heating system that would sufficiently support the installation and security forces based at Fort Wainwright.

3.19 Irreversible and Irretrievable Commitments of Resources

The environmental analysis of the alternatives includes the avoidance, minimization, or other mitigation of potential adverse effects on natural, cultural, and environmental resources; however, all adverse impacts may not be completely avoided and/or mitigated.

Irreversible and irretrievable commitments of resources refer to impacts on or losses of resources that cannot be reversed or recovered, even after an activity has ended. Irreversible commitment applies primarily to nonrenewable resources, such as minerals or cultural resources, and to those resources that are renewable only over long time spans, such as soil productivity. It could also apply to the loss of an experience as an indirect effect of a "permanent" change in the nature or character of the land. An irretrievable commitment of resources refers to the loss of production or value of resources and represents lost opportunities for the period when the resource cannot be used. For example, the development of a vegetated area is an irretrievable action, but the action is not irreversible. If the area is returned to vegetation, it is possible to resume production.

The following paragraphs describes the irreversible and irretrievable commitments of resources for the three action alternatives; these impacts would be permanent. The No Action Alternative would be a continuation of the existing conditions described in the Affected Environment discussions throughout Chapter 3.

The Proposed Action would require consumption of fossil fuel and use of labor as well as construction materials such as steel, cement, aggregate, and bituminous materials. The use of energy, labor, and raw materials is largely irreversible and irretrievable, with the exception of items that could be salvaged during demolition, repurposed, removed at the end of the facility's design life, and/or recycled.

Materials. Material resources irretrievably used for the Proposed Action would include copper, lead, steel, concrete, and other materials. These materials are not in such short supply that implementation of the Proposed Action would limit other unrelated construction activities. The irretrievable use of these material resources would not be significant.

Energy. Energy resources used for the Proposed Action would be irretrievably lost. During construction, gasoline and diesel fuel would be used for the operation of vehicles and equipment. During the long-term, operation of the selected heating system, intermittent maintenance, and repair activities would also require gasoline and diesel fuel. Because the system that would be installed, under any of the action alternatives, would be technologically advanced from the existing CHPP, and operation of the new facility would replace the former CHPP for existing heat and electrical demand, the new plant would not be expected to place a significant demand on availability of energy resources in the region. Therefore, limited impacts would be expected from the consumption of energy.

Landfill Space. The potential disposal of excavated soils as required in a landfill would be an irretrievable, adverse impact. There are numerous rubble landfills and construction and demolition processing facilities that could manage the waste generated. Any waste generated by the Proposed Action that is disposed of in a landfill would be considered an irretrievable loss of that landfill space.

Human Resources. The use of human resources for construction is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work. The use of human resources, however, represents employment opportunities and is considered beneficial.

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4. Lists of Preparers and Contributors

4.1 Preparers

Table 4.1-1 lists the individuals responsible for preparing this Draft EIS and their areas of technical expertise.

Table 4.1-1. List of Preparers

Name of Preparer	Title	Education	Experience/Role
U.S. Army Garrison Alaska, Fort Wainwright			
James M. Arnold	Contract Performance	BS, Business Administration	15 years Contributed to overall document preparation and review
Tracy Carter	Fort Wainwright Legal	JD, Law BS, Political Science	25 years Contributed to overall document preparation and review
Edward Chacho	Fort Wainwright Technical/Funding	BS, Civil Engineering	15 years Contributed to overall document preparation and review
Elizabeth Cook	Cultural Resources Manager	MA, Cultural Anthropology BA, Anthropology	5 years Contributed to overall document preparation and review
Eric Dick	Environmental Compliance Branch Chief – DPW	MS, Chemistry BS, Chemical Engineering	15 years Contributed to overall document preparation and review
Daniel J. Gilson	Garrison Antiterrorism & Operations Security Officer	AAS, Law Enforcement	15 years Conducted Operations Security (OPSEC) review of document
Jennifer Meyer	Operations and Maintenance Division Chief	BS, Engineering Physics	12 years Contributed to overall document preparation and review

Name of Preparer	Title	Education	Experience/Role
Dorothy Pender, PE	Deputy DPW	PhD, Electrical Engineering	25 years Contributed to overall document preparation and review
Ida Petersen, PE	Water Program Manager	BS, Civil Engineering	9 years Contributed to overall document preparation and review
Laura Sample	NEPA Program Manager	MNRS, Natural Resource Management BS, Anthropology	7 years Responsible for overall document review and project management
Grant Sattler	Public Affairs Officer	MA, Communication BA, Journalism	35 years Contributed to overall document preparation and review
Tim Sponseller, PE	DPW Chief	BS, Civil Engineering	33 years Contributed to overall document preparation and review
Matthew Sprau	Planning Branch Chief	BS, Natural resources Management, Forest Sciences	10 years Contributed to overall document preparation and review
Dean Tubandt	Senior Management Analyst	MA, Business	34 years Contributed to overall document review
Lawrence (Jess) Ward	Management and Program Analyst	WOSC, Military Logistics and Leadership	26 years Contributed to overall document review
UP-Guernsey			
Ashish Agrawal	Senior Privatization Consultant	BS, MS, PhD, Electrical Engineering	22 years Contributed to overall document preparation and review

Name of Preparer	Title	Education	Experience/Role
Brice Environmental			
Jerry Guo	NEPA Coordinator	MS, Natural Resources and Environment BS, Biology BS, Economics	2 years Contributed to overall document preparation and review
HDR Engineering, Inc			
Erin Cunningham, PWS	Environmental Scientist	BS, Biology and Earth Sciences	20 years Responsible for Water Resources analyses
Timothy Didlake	Environmental Scientist	BS, Earth Sciences	11 years Responsible for Utilities analysis
M. Kirk Dunbar	Senior Air Quality Specialist	BS, Aeronautical/ Astronautical Engineering	28 years Responsible for Air Quality analysis
Leigh Hagan	Senior Environmental Scientist	MESM, Environmental Science and Management BS, Biology	15 years Responsible for QA/QC review of multiple resource analyses
Christie Haupert	Environmental Scientist	MS, Chemical Oceanography BS, Biochemistry and Molecular Biology	18 years Responsible for overall document preparation and review
Carolyn Hein	Environmental Scientist	BS, Environmental Science	<1 year Responsible for Noise, Land Use and Transportation and Traffic analyses
Nora Hotch	Environmental Scientist	BA, Environmental, Population, and Organismic Biology	15 years Deputy project manager, responsible for supporting project management and task management

Name of Preparer	Title	Education	Experience/Role
Abbey Humphreys	Environmental Scientist	MS, Biology BS, Environmental Biology BS, Geospatial Science	3 years Responsible for Hazardous and Toxic Materials and Wastes analysis, and Airspace analysis
Edward Liebsch	Senior Air Quality Specialist	MS, Meteorology	39 years Responsible for review of Air Quality analysis
Tobin Lilly	Senior GIS Analyst	BS, Computer Science	16 years Responsible for all mapping and GIS analysis
Paul McLarnon	Project Manager	BS, Aquatic Resources	25 years Project manager, responsible for overall document preparation and management
Robyn Miller	Cultural Resources Business Class Leader	MA, Anthropology BA, Classics	11 years Responsible for review of Cultural Resources analysis
Deborah Peer	Senior Environmental Scientist	MS, Environmental Science and Management BS, Zoology BS, Wildlife Science	19 years NEPA analysis, Responsible for overall document preparation and review
Chase Quinn	Project Coordinator		2 years Responsible for overall document preparation
Sue Signor	Senior Project Coordinator	BBA, Business Administration	35 years Responsible for overall document preparation and review

Name of Preparer	Title	Education	Experience/Role
Patrick Solomon, CEP	Senior NEPA Technical Advisor	MS, Geography BA, Geography	26 years NEPA analysis, Responsible for overall document preparation and review
Sean Teeter, RPA	Cultural Resource Specialist	MA, Anthropology	14 years Responsible for Cultural Resources analysis
Patricia Terhaar	Senior Peer Reviewer	MS, Geology	34 years Responsible for Geology and Soil Resources analysis
Josie Wilson	Strategic Communications Manager	MBA, Marketing and Organizational Behavior BS, Business Administration	18 years Responsible for communications and outreach
John Wolfe	Senior NEPA Planner	BA, Writing	27 years Responsible for the Human Health and Safety and the Geology and Soil Resources analyses
Northern Economics, Inc.			
Leah Cuyno	Senior Economist	PhD, Agricultural and Applied Economics MS, Agricultural Economics BS, Agricultural Economics	21 years Responsible for Socioeconomics analysis
Marcus Hartley	Principal Economist	MS, Agricultural and Resource Economics BA, History	30 years Responsible for Socioeconomics analysis

Name of Preparer	Title	Education	Experience/Role
Don Schug	Socioeconomics Analyst	PhD, Geography MS, Agricultural and Resource Economics MS, Oceanography	19 years Responsible for Environmental Justice analysis
Resolution 3D LLC			
Dov Margalit	Lead Visualization Artist	BA, Industrial Design, Product Design	20 years Responsible for viewshed graphics and alternative renderings
Drew Swarts	Visualization Artist	BS, Virtual Technology and Design	10 years Responsible for viewshed graphics and alternative renderings

4.2 Contributors

Table 4.2-1 lists additional individuals who contributed to the Draft EIS.

Table 4.2-1. List of Contributors

Name of Preparer	Title	Education	Experience/Role
Headquarters, Department of the Army			
David Howlett	Counsel/JAG	BA, JD, LLM, Environmental Law	25 years Contributed to overall document review
Andrea Pahlevanpour	Environmental Program Manager	MA, Geography	16 years Contributed to overall document review
Headquarters, U.S. Army Installation Management Command			
Yvonne Tyler	HQDA Environmental Program Manager	BBA	25 years Contributed to overall document review

Name of Preparer	Title	Education	Experience/Role
U.S. Army Corps of Engineers, Alaska District			
Matthew Ferguson	USACE Project Manager	BS, Biology MS, Environmental Management	3 years Responsible for project management and contributed to overall document review
Michael Salyer	Contracting Officer's Representative	MS, Wildlife Biology	26 years Contributed to overall document review
U.S. Army Environmental Command			
Bryan Davis	Environmental Attorney	JD, LLM, Environmental Law	10 years Contributed to overall document review
Sam Klein	Environmental Support Manager, West Region	MBA BS, Civil Engineering	10 years Contributed to overall document review
Cathy Kropp	Environmental Public Affairs Specialist		20 years Contributed to overall document review
Pamela Klinger	NEPA Program Manager	Master of Planning BS, Geology	30 years Contributed to overall document review

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5. Distribution List

FEDERAL OFFICIALS AND AGENCIES

Senators

Trina Bailey
Regional Special Assistant to U.S. Senator Lisa Murkowski
250 Cushman Avenue, Suite 2D
Fairbanks, Alaska 99701

Greg Bringhurst
Regional Director to U.S. Senator Dan Sullivan
101 12th Ave, Suite 328
Fairbanks, AK 99701

Representatives

Emily Peterson-Wood
Special Assistant to U.S. Representative Don Young
100 Cushman St., Suite 307
Key Bank Building
Fairbanks, AK 99701

Agencies

Geoff Beyersdorf, District Manager
Bureau of Land Management
Fairbanks District Office
222 University Avenue
Fairbanks, AK 99709

Tim LaMarr, Field Manager
Bureau of Land Management
Central Yukon Field Office
222 University Avenue
Fairbanks, AK 99709

Kyle Cowan, Associate Deputy State Director of Fire and Aviation
Bureau of Land Management – Alaska Fire Service
P.O. Box 35005
Fort Wainwright, AK 99703

Don Striker, Acting Regional Director
National Park Service
240 West 5th Avenue, Room 114
Anchorage, AK 99501-1365

Jennifer Pederson Weinberger
Cultural Resources Program Manager
National Park Service
240 West 5th Avenue, Room 114
Anchorage, AK 99501-1365

Sarah Conn, Field Supervisor
U.S. Fish and Wildlife Service
Fairbanks Field Office
101 12th Avenue, Room 110
Fairbanks, AK 99701

Bob Henszey, Branch Chief of Planning and Consultation
U.S. Fish and Wildlife Service
Fairbanks Field Office
101 12th Avenue, Room 110
Fairbanks, AK 99701

Jennifer Curtis, NEPA Reviewer
U.S. Environmental Protection Agency
Region 10 – Alaska Operations Office
Federal Building Room 537
222 West 7th Avenue #19
Anchorage, AK 99513-7588

STATE OFFICIALS AND AGENCIES

Audra Brase, Regional Supervisor - Fairbanks
Alaska Department of Fish and Game
1300 College Road
Fairbanks AK 99701-1599

Darren Bruning, Regional Supervisor – Region III
Alaska Department of Fish and Game - Division of Wildlife Conservation
1300 College Road
Fairbanks AK 99701-1599

Nancy Sonafrank, Program Manager
Alaska Department of Environmental Conservation – Water Quality Standards, Assessment, and Restoration
555 Cordova Street
Anchorage, AK 99501

Alice Edwards, Division Director
Alaska Department of Environmental Conservation – Division of Air Quality
PO Box 111800
Juneau, AK 99811-1800

Denise Koch, Division Director
Alaska Department of Environmental Conservation – Division of Spill Prevention and Response
PO Box 111800
Juneau, AK 99811-1800

Judith Bittner, Alaska Historic Preservation Officer
Alaska Department of Natural Resources
Office of History and Archaeology
550 W 7th Avenue
Suite 1310
Anchorage, AK 99501-3565

Sarah Meitl, Review and Compliance Coordinator
Alaska Department of Natural Resources
Office of History and Archaeology
550 W 7th Avenue
Suite 1310
Anchorage, AK 99501-3565

Jeanne Proulx, Northern Regional Land Office Manager
Alaska Department of Natural Resources, Division of Mining, Land and Water
3700 Airport Way
Fairbanks, AK 99709

Public Information Center
Alaska Department of Natural Resources
3700 Airport Way
Fairbanks, AK 99709-4699

Paloma Harbour
Alaska Department of Labor and Workforce Development – Administrative Services
675 7th Avenue
Fairbanks, AK 99701

Judy Chapman, Planning Chief
Alaska Department of Transportation and Public Facilities
2301 Peger Road, MS-2550
Fairbanks, AK 99709

Caitlin Frye, Information Officer
Alaska Department of Transportation and Public Facilities
2301 Peger Road, MS-2550
Fairbanks, AK 99709

Ryan Anderson, Regional Director
Alaska Department of Transportation
and Public Facilities
2301 Peger Road, MS-2550
Fairbanks, AK 99709

Adam Wool
Alaska House of Representatives
1292 Sadler Way, Suite 324
Fairbanks, AK 99701

Bart LeBon
Alaska House of Representatives
1292 Sadler Way, Suite 304
Fairbanks, AK 99701

David Talerico
Alaska House of Representatives
1292 Sadler Way, Suite 324
Fairbanks, AK 99701

Grier Hopkins
Alaska House of Representatives
1292 Sadler Way, Suite 304
Fairbanks, AK 99701

Steve Thompson
Alaska House of Representatives
1292 Sadler Way, Suite 304
Fairbanks, AK 99701

Mike Prax
Alaska House of Representatives
301 Santa Claus Lane
North Pole, AK 99701

Click Bishop
Alaska Senate
1292 Sadler Way, Suite 308
Fairbanks, AK 99701

John Coghill
Alaska Senate
1292 Sadler Way, Suite 340
Fairbanks, AK 99701

Scott Kawasaki
Alaska Senate
1292 Sadler Way, Suite 308
Fairbanks, AK 99701

LOCAL OFFICIALS AND AGENCIES

The Honorable Jim Matherly, Mayor
City of Fairbanks, Alaska
800 Cushman Street
Fairbanks, AK 99701

Teal Sodan, Communications Director
City of Fairbanks, Alaska
800 Cushman Street
Fairbanks, AK 99701

The Honorable JW Musgrove, Mayor
City of Delta Junction
PO Box 803
2288 Deborah Street
Delta Junction, AK 99737

The Honorable Michael Welch, Mayor
City of North Pole
125 Snowman Lane
North Pole, AK 99705

Jackson Fox, Executive Director
Fairbanks Area Surface Transportation
Planning
100 Cushman St., Suite 205
Fairbanks, AK 99701

Jim Styers, Fire Chief
Fairbanks Fire Department
1101 Cushman St.
Fairbanks, AK 99701

The Honorable Bryce Ward, Mayor
Fairbanks North Star Borough
PO Box 71267
Fairbanks, AK 99707-1267

Donald Galligan, Transportation Planner
Fairbanks North Star Borough
907 Terminal St.
Fairbanks, AK 99701

Lanien Livingston, Public Information Officer
Fairbanks North Star Borough
PO Box 71267
Fairbanks, AK 99707-1267

Nancy Durham, Flood Plain Administrator
Fairbanks North Star Borough
PO Box 71267
Fairbanks, AK 99707-1267

Sabrina Brinkley, Board Chair
Greater Fairbanks Chamber of Commerce
100 Cushman St., Suite 102
Fairbanks, AK 99701

ALASKA NATIVE TRIBES

Evelyn Combs, Council Member
Healy Lake Village
P.O. Box 60300
Fairbanks, AK 99706

Herbert Demit, President
Native Village of Tanacross
P.O. Box 76009
Tanacross, AK 99776

Michael Sam, First Chief
Native Village of Tetlin
P.O. Box 797
Tok, AK 99780

Tim McManus, First Chief
Nenana Native Association
P.O. Box 356
Nenana, AK 99760

Gerald Albert, President
Northway Village
P.O. Box 516
Northway, AK 99764

Bob Sattler, Senior Archeologist/Environmental Quality Analyst
Tanana Chiefs Conference
122 1st Ave
Fairbanks, AK 99701

Tracy Charles-Smith, President
Village of Dot Lake
1477 Carr Ave
Fairbanks, AK 99709

NON-GOVERNMENTAL AGENCIES

Ronald K Inouye
Tanana Yukon Historical Society
P.O. Box 71336 Riverview Dr.
Fairbanks, AK 99701

Public Affairs Office
U.S. Army Corps of Engineers
PO Box 6898
Joint Base Elmendorf-Richardson, AK 99506-0898

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7. Glossary

Advisory Council on Historic Preservation—An independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources, and advises the President and Congress on national historic preservation.

Affected environment—The existing environment to be affected by a proposed action and alternatives.

Air pollution—The presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life or to property, or to interfere unreasonably with the comfortable enjoyment of life and property.

Air quality—A resource that incorporates several components that describe the levels of overall air pollution within a region, sources of air emissions, and regulations governing air emissions.

Ambient air—Any unconfined portion of the atmosphere: open air, surrounding air.

Attainment area—An area considered to have air quality as good as or better than the National Ambient Air Quality Standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Best management practices (BMPs)—Methods that have been determined to be the most effective, practical means of preventing or reducing pollution or other adverse environmental impacts.

Biological resources—Native and nonnative plant and animal species and the habitats used by those species.

Consulting parties—Entities that have consultative roles in the Section 106 process, including the State Historic Preservation Officer, Indian tribes, representatives of local governments, individuals or organizations with a demonstrated interest in the undertaking, and members of the public (see 36 CFR § 800.2).

Cultural resources— Physical material items associated with past human activities. Examples include prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reason.

Cumulative effects—Under National Environmental Policy Act regulations, the incremental environmental impact or effect of an action together with the effects of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR § 1508.7).

Decibel—A logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level and is used as a measure of sound pressure level.

Environmental Impact Statement (EIS)—A document prepared to analyze the impacts on the environment of a proposed project or action and released to the public for comment and review. EISs are prepared when there is the potential for severe impacts on natural, cultural or socioeconomic resources. An EIS must meet the requirements of National Environmental Policy Act, the CEQ, and the directives of the agency responsible for the proposed project or action.

Executive Order—Official proclamation issued by the President that may set forth policy or direction or establish specific duties in connection with the execution of federal laws and programs.

Floodplain—An area of low-lying ground adjacent to rivers or stream channels, formed mainly of river sediments that may normally be dry but become inundated with water during flood events. A floodplain extends from the edges of a stream or riverbank to the outer edges of a valley, providing a broad area to disperse and temporarily store floodwaters.

Geology—The study of surface and subsurface materials of the earth, the features and structures of materials, and the processes that act upon them. Within a given physiographic province, features include topography, soils, minerals, and paleontology, where applicable.

Groundwater—Water below the ground's surface that is contained in the spaces and cracks of rocks and/or unconsolidated materials, such as sand or gravel. Groundwater aquifers are replenished by rain and snowmelt that seeps down into the ground and infiltrates cracks and crevices of soils and/or rocks below ground. Groundwater typically moves relatively slowly and may eventually recharge surface water, such as streams and lakes.

Hazardous and toxic material or substance—A material or substance that poses a risk to human health or the environment.

Historic property—Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register. The term includes artifacts, records, and remains which are related to such district, site, building, structure, or object. 54 U.S.C. § 300308.

Human health and safety—The consideration of facets of military activities and materials that potentially pose a risk to the health, safety, and well-being of the public, military personnel, civilian employees, and dependents.

Impact—A change. Types of impacts are described below.

> **Beneficial impact**—An impact that would result in a positive change in the condition or appearance of the resource or a change that would move the resource toward a desired condition.

Adverse impact— An impact that would result in a negative change to the appearance or condition of the resource.

Short-term impact— An impact that would be temporary and associated with the demolition/construction phase but would no longer occur once demolition/construction is completed or shortly thereafter.

Long-term impact— An impact that would be permanent or would persist for the operational life of the project.

Institutional Control—An administrative measure to control property access and usage and are applicable to known or suspected contaminated sites. Institutional controls (such as limitations on the location and depth of excavations, water use, property transfer agreement restrictions, etc.) are designed to supplement active contaminant reduction and remediation actions, as appropriate, for short-term and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants and to safeguard human health and safety and environmental resources.

Invasive species—A plant or animal species that is not native to a specific location but has been introduced and its presence either causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health.

Land use—A real property classification that indicates natural conditions or human activity. Natural conditions of property can be described or categorized as unimproved, undeveloped, preservation, or conservation areas. Human land use categories include residential, commercial, industrial, agricultural, institutional, and recreational.

Lend-Lease operations—Under Public Law 77-11, the U.S. government assisted Allied forces during the war by providing Lend-Lease deliveries of aircraft and war materiel. From 1942–1945, the U.S. supplied the Soviet Union with more than 7,900 U.S.-built aircraft over the Alaska-Siberia, or ALSIB, route. Pilots from the Air Transport Command flew aircraft from Great Falls, Montana, through Canada and Alaska until they reached Ladd Field. At Ladd Field (the official transfer point), Soviet pilots took over the ferrying operation, flying the aircraft to Nome, then across Siberia and on to the European war front.

Level of Service (LOS)—A qualitative measure that describes operational conditions and provides an index to the quality of traffic flow. LOS is defined in letter designations from A (no congestion on the road) to F (roadways that are overcapacity).

Maintenance area—An area that has previously been designated nonattainment and has been redesignated to attainment for a probationary period through implementation of a maintenance plan.

National Environmental Policy Act of 1969 (NEPA)—The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for implementing these goals within the federal agencies. It requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

National Historic Landmark—Nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. At present, there are only 2,500 properties with this distinction.

National Historic Preservation Act of 1966 (NHPA), as Amended (54 U.S.C. § 300101 et seq.)—An act to establish a program for the preservation of historic properties throughout the nation, and for other purposes, approved October 15, 1966 (PL 89-665; 80 Stat. 915; 16 U.S.C. § 470 as amended by PL 91-243, PL 93-54, PL 94-422, PL 94-458, PL 96-199, PL 96-244, PL 96-515, PL 98-483, PL 99-514, PL 100-127, and PL 102-575). See Section 106 and National Register of Historic Places.

National Register of Historic Places (NRHP)—A register of districts, sites, buildings, structures, and objects of significant state, local, and national historic properties, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

Noise—Any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, can be steady or impulsive, and can involve a number of sources and frequencies.

Nonattainment area—A geographic area where concentrations of a criteria pollutant exceed the National Ambient Air Quality Standard for that pollutant.

Petroleum, Oil, and Lubricants (POL)—Petroleum products that include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Polychlorinated biphenyl (PCB)—A man-made chemical that persists in the environment and was widely used in building materials (e.g., caulk) and electrical products before 1979.

Record of Decision (ROD)—The ROD is the final step for agencies in the EIS process. It states what the decision is; identifies the alternatives considered, including the environmentally preferred alternative; and discusses mitigation plans, including any enforcement and monitoring commitments.

Region of Influence (ROI)—The geographic extent of potential effects from the alternatives on the important elements of a resource.

Scoping—Scoping, as part of NEPA, requires examining a proposed action and its possible effects, establishing the depth of environmental analysis needed, and determining analysis procedures, data needed, and task assignments. The public is encouraged to participate and submit comments on proposed projects during the scoping period.

Section 106—Section 106 of the NHPA, as Amended, and as implemented in 36 CFR Part 800, requires federal agencies to consider the effects of federally funded, regulated, or licensed undertakings on cultural resources listed in or eligible for inclusion in the National Register. In addition, the federal agency must afford the ACHP the opportunity to comment in the event that an undertaking will have an adverse effect on a cultural resource that is eligible for or listed in the National Register.

Socioeconomics—The science that studies social and economic conditions of the human environment. Indicators of socioeconomic conditions include population, employment, unemployment rate, income, cost of living, and housing availability.

Solid waste—Any garbage, refuse, sludge, or other discarded materials resulting from industrial, commercial, institutional, and residential activity.

State Historic Preservation Officer—The official appointed by the governor of a state or territory to carry out the state's responsibilities under the National Historic Preservation Act.

Surface water—Water in rivers and streams (i.e., flowing waters), lakes, reservoirs, ponds, and wetlands. Surface waters and their ecosystems support plant and wildlife species and are important to the economic, recreational, and human health of a community or locale.

Sustainability—For this EIS, a focus on energy use and reliable energy production, along with the continued capability to maintain the mission at Fort Wainwright. Sustainability consists of the technologies, systems, physical structures, management strategies, and cultural practices that, when incorporated into design and use of infrastructure and utilities, enable resource-use-efficiency that supports operational readiness while maintaining balance with the natural environment.

Traffic—The movement of vehicles on transportation networks such as roadways and rail systems.

Unexploded ordnance (UXO)—Explosive weapons, including bombs, shells, grenades, land mines, naval mines, cluster munition, etc., that did not explode when they were employed and have never been detonated.

Utilidor—A steam and condensate main installed inside a concrete tunnel network connecting buildings. Distribution lines for other utilities, including potable and fire water distribution, wastewater collection (i.e., sewer), hot water supply and return, glycol supply and return, and low-voltage electrical and communication systems, are often collocated in a utilidor.

Wildlife—Undomesticated bird, fish, amphibian, and mammal species that occur in the environment. Wildlife and plant species, or subspecies, may be considered as either "threatened" or "endangered" depending on their risk for extinction. The term "endangered" is generally used for a species in danger of extinction and "threatened" if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

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APPENDIX A

AGENCY AND TRIBAL SCOPING LETTERS

During the scoping process for the Fort Wainwright Heat and Electrical Upgrades Environmental Impact Statement (EIS) the United States (U.S.) Army Garrison Fort Wainwright, Alaska (USAG Alaska) sent scoping invitation letters to the following agency and organization representatives:

Trina Bailey
Regional Special Assistant to U.S. Senator Lisa Murkowski, U.S. Senate

Bob Sattler
Liaison-Realty Specialist
Tanana Chiefs Conference

Geoff Beyersdorf
District Manager, Fairbanks District Office
Bureau of Land Management

Audra Brase
Regional Supervisor – Fairbanks Habitat Division
Alaska Department of Fish and Game

Darren Bruning
Regional Supervisor – Fairbanks Wildlife Conservation Division
Alaska Department of Fish and Game

Ryan Anderson
Regional Director, Northern Region
Alaska Department of Transportation and Public Facilities

Judy Chapman
Planning Chief, Northern Region
Alaska Department of Transportation and Public Facilities

The Hon. Click Bishop
Alaska Senate

Sarah Conn
Field Supervisor, Fairbanks Field Office
U.S. Fish and Wildlife Service

Kyle Cowan
Associate Deputy State Director, Fire and Aviation
Bureau of Land Management – Alaska Fire Service

Alice Edwards
Division Director, Division of Air Quality
Alaska Department of Conservation

Jennifer Curtis, NEPA Reviewer
U.S. Environmental Protection Agency

Nancy Durham
Floodplain Administrator
Fairbanks North Star Borough

Donald Galligan
Transportation Planner
Fairbanks North Star Borough

Bert Frost
Regional Director
National Park Service

Leslie Hajdukovich
Regional Director to U.S. Senator Dan Sullivan
U.S. Senate

Denise Koch
Division Director, Division of Spill Prevention and Response
Alaska Department of Conservation

Lanien Livingston
Public Information Officer
Fairbanks North Star Borough

The Hon. Bart LeBon
Alaska House of Representatives

The Hon. Scott Kawasaki
Alaska Senate

The Hon. John Coghill
Alaska Senate

Fairbanks Public Information Center
Alaska Department of Natural Resources

Jackson Fox
Executive Director
Fairbanks Metropolitan Area Transportation System

Paloma Harbour, Director
Alaska Department of Labor and Workforce Development

Bob Henszey
Conservation Planning Assistance Branch Chief, Fairbanks Field Office
U.S. Fish and Wildlife Service

Meadow Bailey
Communications Director, Office of the Commissioner
Alaska Department of Transportation and Public Facilities

Justin Hogrefe
Environmental Program Manager, 354 CES/CEIE
Bldg 22588
Eielson Air Force Base

Ronald K. Inouye
President
Tanana Yukon Historical Society

The Hon. Grier Hopkins
Alaska House of Representatives

Public Affairs Office
Alaska District Headquarters
U.S. Army Corps of Engineers

The Hon. Jim Matherly, Mayor
City of Fairbanks

The Hon. Michael Welch, Mayor
City of North Pole

Jim Styers, Chief
Fairbanks Fire Department

Jennifer Pederson Weinberger
Team Manager Cultural Resources Team
National Park Service

Teal Soden
Communications Director
City of Fairbanks

Nancy Sonafrank
Program Manager – Division of Water
Alaska Department of Conservation

The Hon. Adam Wool
Alaska House of Representatives

The Hon. David Talerico
Alaska House of Representatives

The Hon. Steve Thompson
Alaska House of Representatives

The Hon. Tammie Wilson
Alaska House of Representatives

The Hon. Bryce Ward, Mayor
Fairbanks North Star Borough

Bruce Newman
Special Assistant to U.S. Representative Don Young
U.S. House of Representatives

Marisa Sharrah
President/CEO
Greater Fairbanks Chamber of Commerce

Jeanne Proulx, Natural Resource Manager
Division of Land, Mining and Water
Alaska Department of Natural Resources

See the attached letter to Ms. Trina Bailey, Regional Special Assistant to U.S. Senator Lisa Murkowski, U.S. Senate as an example of the letter sent to each individual.

DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, U.S. ARMY GARRISON ALASKA
1046 MARKS ROAD #6000
FORT WAINWRIGHT, ALASKA 99703-6000

Office of the Garrison Commander JUL 23 2019

SUBJECT: Invitation to the Agency Scoping Meeting, Environmental Impact Statement for Heat and Electrical Upgrades at Fort Wainwright, Alaska

Ms. Trina Bailey
Regional Special Assistant to U.S. Senator Lisa Murkowski
U.S. Senate
250 Cushman Avenue, Suite 2D
Fairbanks, AK 99701

Dear Ms. Bailey:

United States Army Garrison Alaska (USAG Alaska) invites you to participate in an agency scoping meeting to discuss an Environmental Impact Statement (EIS) being prepared to evaluate the potential impacts on the natural and man-made environment from proposed heat and electrical at Fort Wainwright, Alaska. Due to the current condition of the Central Heat and Power Plant, USAG Alaska needs to construct reliable heat and electrical infrastructure to reduce utility costs, help safeguard mission readiness, meet energy efficiency standards, be compliant with emissions standards, minimize the risk of a single point catastrophic failure, and conform to United States Army directed energy security criteria. The purpose of the proposed upgrades is to provide reliable heat and electrical infrastructure for Fort Wainwright that resolves current safety, resiliency, fiscal, and regulatory concerns.

The agency scoping meeting will be held Wednesday, August 7, 2019 in Fairbanks, Alaska at the Noel Wien Public Library Conference Room, 1215 Cowles Street, from 3:00 p.m. to 5:00 p.m. A public scoping meeting is scheduled in Fairbanks, Alaska on Thursday, August 8, 2019 at the Carlson Center Pioneer Room, 2010 2nd Avenue, from 5:00 p.m. to 8:00 p.m., with a presentation given at 6:30 p.m.

In addition to comments received during the scoping meetings, written comments will be accepted for consideration and analysis in the draft EIS. The public comment period will end on August 21, 2019, which is 30 days after the July 22, 2019 publication of the EIS Notice of Intent in the Federal Register by the Department of the Army. Written comments may be submitted via mail or email to Ms. Laura Sample, National Environmental policy Act (NEPA) Program Manager, ATTN: IMFW-PWE (Sample), 1046 Marks Road #6000, Fort Wainwright, Alaska 99703-6000, or email: usarmy.wainwright.id-pacific.mbx.heu-eis@mail.mil.

A copy of the EIS Notice of Intent published in the Federal Register is accessible online at: https://home.army.mil/wainwright/index.php/about/environmental/national-environmental-policy-act-nepa.

USAG Alaska looks forward to your participation in the EIS scoping process. If you would like any additional information, please contact Ms. Laura Sample, NEPA Program Manager, at (907) 361-6323 or usarmy.wainwright.id-pacific.mbx.heu-eis@mail.mil.

Sincerely,

Christopher J. Ruga
Colonel, US Army
Commanding

During the scoping process for the Fort Wainwright Heat and Electrical Upgrades Environmental Impact Statement (EIS) the United States (U.S.) Army Garrison Fort Wainwright, Alaska (USAG Alaska) sent scoping invitation letters to the following tribal organization representatives:

Gerald Albert
President
Northway Village

Herbert Demit
President
Native Village of Tanacross

Michael Sam
First Chief
Native Village of Tetlin

Tracy Charles-Smith
President
Village of Dot Lake

Tim McManus
First Chief
Nenana Natives Association

Evelyn Combs
Secretary-Treasurer
Healy Lake Village

See the attached letter to Gerald Albert, President, Northway Village as an example of the letter sent to each individual.

DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, U.S. ARMY GARRISON ALASKA
1046 MARKS ROAD #6000
FORT WAINWRIGHT, ALASKA 99703-6000

Office of the Garrison Commander JUL 23 2019

SUBJECT: Offer of Government-to-Government Consultation on the Heat and Electrical Upgrades at Fort Wainwright, Alaska

Gerald Albert, President
Northway Village
P.O. Box 516
Northway, AK 99764

Dear President Albert:

United States Army Garrison Alaska (USAG Alaska) invites you to participate in an agency scoping meeting to discuss an Environmental Impact Statement (EIS) being prepared to evaluate the potential impacts on the natural and man-made environment from proposed heat and electrical upgrades at Fort Wainwright, Alaska. Due to the current condition of the Central Heat and Power Plant, USAG Alaska needs to construct reliable heat and electrical infrastructure to reduce utility costs, help safeguard mission readiness, meet energy efficiency standards, be compliant with emissions standards, minimize the risk of a single point catastrophic failure, and conform to United States Army-directed energy security criteria. The purpose of the proposed upgrades is to provide reliable heat and electrical infrastructure for Fort Wainwright that resolves current safety, resiliency, fiscal, and regulatory concerns.

A public scoping meeting is scheduled in Fairbanks, Alaska on Thursday, August 8, 2019 at the Carlson Center Pioneer Room, 2010 2nd Avenue, from 5:00 p.m. to 8:00 p.m. Written comments for inclusion in the draft EIS will also be accepted. The public comment period will end on August 21, 2019, which is 30 days after the July 22, 2019 publication of the EIS Notice of Intent in the Federal Register by the Department of the Army.

If you believe that a tribe-specific scoping meeting is warranted for this National Environmental Policy Act (NEPA) action or if you wish to enter into government-to-government consultation because you feel this proposed activity may significantly affect tribal rights or protected resources, please advise Ms. Elizabeth A. Cook in writing within 30 days after July 22, 2019. Please consider this letter our notification in accordance with the Department of Defense (DOD) Instruction Number 4710.02: DoD Interactions with Federally Recognized Tribes and the DoD American Indian and Alaska Native Policy.

Requests should be directed to Ms. Elizabeth Cook, USAG Alaska Native Liaison, ATTN: IMFW-PWE (Cook), 1046 Marks Road #6000, Fort Wainwright, Alaska 99703-6000 or elizabeth.a.cook80.civ@mail.mil.

Sincerely,

Christopher J. Ruga
Colonel, US Army
Commanding

APPENDIX B

SCOPING COMMENTS

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 7, 2019 | NOEL WIEN PUBLIC LIBRARY

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail.

What are fuel sources? Will they be accessible and possibly be available from Alaska sources?

If Eielson AFB similarly needs upgrading, would a mutual upgrade be beneficial?

How are other non-US arctic military installations powered in Canada, Greenland, Scandinavia, Russia? Anything to learn from them?

What about small scale nuclear reactors as was proposed for Galena?

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Ron Inouye
Email: [redacted] **Phone:** [redacted]
Address: [redacted]
City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

MIKE MEEKS - Formal comments

8/7/19

City of Fairbanks

Question Regarding Fort Wainwrights (FWA) EIS for the Power Plant

1) There are three studies that were conducted about the power plant and different courses of action. Can we receive a copy of those studies or do we need to do a FOIA request?
1) Can the Army make a unilateral decision regarding converting to an alternative fuel source or do you need to also have an agreement with the RCI partner?
2) Currently the Army is subsidizing the utility costs for the RCI partner. Will the Army continue to do this subsidy if a different fuel source or concept is used?
3) Can gas lines be used in the current utilidors?
    a. If yes – what coordination or potential costs would be associated with using the utilidors?
    b. Can the Army direct that the utilidors be used for gas pipelines or does it require Doyon's approval?
    c. If no – will the Army assume all the environmental risk associated with trenching new lines? FWA is a superfund site.
    d. What restrictions can be expected when crossing over utilidors, existing communication lines, etc? Who will have priority?
4) Would the Army allow a gas transmission line to run through FWA?
5) Would the Army allow an LNG tank to be placed on its property?
6) Would the Army allow for railhead operations to download LNG from a train to the tank on FWA property?
7) If the steam lines are no longer being utilized has the Army accounted for how it will keep the water and sewer lines from freezing inside the utilidor's? Is that an Army problem or will it be the contractor's problem?
8) Some of the housing areas have mechanical buildings that feed multiple homes. Does the Army want to stay with that concept, or does it want each facility to have its own meter?
9) Will the Army want metering information that it can use for its own purposes?
10) Will there be any restrictions by the Army on smart meters being used? This includes Cyber Security issues.
11) Is the Army willing to divest itself from the Co-gen plant operations and buy electrical power from GVEA?
12) Is the Army planning on issuing an Army contract that will be managed by Army Contracting or is the Army going to relay solely on the Regulatory Commission of Alaska (RCA) to provide the oversite, or a hybrid situation that now exists with Doyon?
13) Will the Army allow a contractor to use current Army GIS information to create additional layers? If so will the Army dictate the software to use?
14) Will the Army provide a master plan for future buildouts for the next 10 years?
15) Will the Army weight energy security over costs or will cost be weighted over energy security?

[redacted]

FORT WAINWRIGHT HEAT AND ELECTRICAL UPGRADES

EIS AGENCY MEETING

Location: Noel Wien Library
Fairbanks, Alaska

Date: August 7, 2019

Time: 3:00 - 5:00 p.m.

P R O C E E D I N G S

LAURA SAMPLE: Well, welcome, everyone and thank you for coming. We appreciate your attendance today. My name is Laura Sample. I'm the NEPA program manager on Fort Wainwright.

And the purpose of this meeting is to garner your input on the heat and electrical upgrades that are being proposed on Fort Wainwright for which we are preparing an Environmental Impact Statement.

And for those of you who are on the phone, as we run through the slides, we will be sure to say that we have moved onto a next slide, but right now, we are on slide 2; this is the agenda. You have all received a more detailed agenda in the e-mail, if you are calling in, and then at the door, if you're here in person.

Does anybody have questions on the agenda? All right. With --

SANDY HALSTEAD: Is there a chance where the speaker can be a little closer to the phone?

JOSIE WILSON: And I can turn it up, too.

LAURA SAMPLE: Yes, thank you.

JOSIE WILSON: Did -- there's a sound from the projector, so we could actually -- yeah, we can actually do that right here.

UNIDENTIFIED VOICE: Thank you.

JOSIE WILSON: You got it.

SANDY HALSTEAD: Much better, thank you. Much better.

LAURA SAMPLE: Great. Thank you for that. So before we get started, I want to do a quick safety moment. So bathroom is outside to the right, just down the hallway a little bit. And in the event of an emergency, we're going to evacuate through the main door outside to the left and congregate in the northern side of the parking lot. We did take everyone's sign-in information, so if there is an emergency and do we have to evacuate, we will take roll out there. In addition, we do have first aid kits here with us if anybody needs anything.

So with that, I would like to take an -- conduct introductions for everybody that is here. So I will start on this side of the room, work down the hall, and then I will call on everybody in the center of the room. And then after that, I will refer to the people on the teleconference. So, Colonel Ruga, we'll start with you.

COLONEL RUGA: Colonel Chris Ruga, Garrison Commander at U.S. Army Garrison Alaska.

CATHERINE MILLER: Catherine Miller, Deputy to the Garrison Commander, U.S. Army Alaska.

DOROTHY PENDER: Dorothy Pender, Deputy DPW.

STEVE STRINGHAM: Steve Stringham, Utilities Division Chief for DPW.

KRISTINA SMITH: Kristina Smith, Air Quality Program Manager for DPW.

LES: Les (indiscernible), Resource Planning Branch Chief, the Environmental Division, U.S. Army Garrison Alaska.

GRANT SATTLER: Grant Sattler, Public Affairs out at the Garrison.

JAMES ARNOLD: James Arnold, DPW Utilities from the Garrison.

MARCUS HARTLEY: I'm Marcus Hartley, Northern Economics. I'm an economist.

MIKE WELCH: I'm Mayor Mike Welch from the City of North Pole.

JOE BURNS: Joe Burns, Chief of Staff to Representative Bart LaBon.

MIKE MEEKS: Mike Meeks, City of Fairbanks.

JOHN HADDIX: John Haddix. I'm the Field Manager for BLM Eastern Interior Field Office.

STEVEN HOKE: Steven Hoke, Department of Environmental Conservation Air Quality.

JUDY CHAPMAN: Judy Chapman, Alaska Department of Transportation Planning Chief for the region.

DON KINGKADE: Don Kingkade. I'm the Plant Manager at Eielson's power plant.

ERIC GIRARD: Eric Girard, Operations Supervisor, Eielson power plant.

MARISA SHARRAH: Marisa Sharrah, Greater Fairbanks Chamber of Commerce.

RON INOUYE: Ron Inouye with the Tanana Yukon Historical Society.

ELIZABETH COOK: Elizabeth Cook, Tanana Yukon Historical Society.

JIM SACKETT: Jim Sackett, Governor's office.

ERIC DICK: Eric Dick, Fort Wainwright Environmental Office.

JUSTIN HOGREFE: Justin Hogrefe, Eielson Environmental Planning Program Manager and NEPA, formerly out of Wainwright DPW Environmental.

KIRK ALKIRE: Kirk Alkire, Senator Sullivan's office at Military Affairs.

LESLIE HAJDUKOVICH: Leslie Hajdukovich with Senator Sullivan's office.

PAUL McLARNON: Paul McLarnon, HDR Engineering, Project Manager.

SUE SIGNOR: Sue Signor, Senior Project Coordinator.

NICK CZARNECKI: Nick Czarnecki, Fairbanks North Star Borough air quality manager.

JOSIE WILSON: This is Marci who is going to be our court reporter today. And I'm Josie Wilson. I'm your public outreach support for this wonderful Environmental

Impact Statement process. And I'll cover a couple things in just a minute.

LAURA SAMPLE: (Indiscernible) people on the phone. Okay. And for those who had called in?

JOSIE WILSON: Sandy, do you want to go first?

SANDY HALSTEAD: Sandy Halstead, the Environmental Protection Agency in Anchorage, Alaska.

LAURA SAMPLE: And I believe we have one more person on the line?

WESLEY: Wesley (indiscernible), Tanacross.

LAURA SAMPLE: Great. And with that --

SARAH: And Sarah (indiscernible) with the office of (indiscernible), DNR.

LAURA SAMPLE: And with that, I'm going to turn it over to Josie Wilson to facilitate.

JOSIE WILSON: Hi, everyone. Happy afternoon. Thank you for coming again. I appreciate it. I'm Josie Wilson and I'm going to be your facilitator for today. A couple of administrative items I just want to go over first. You probably already figured it out, but you are being recorded. So it's very important to know that we could access this for the public record, so if there is anything that you prefer to not have -- it's classified or not have shared in a public setting, please refrain from saying it.

Additionally, Marci has done a fabulous job of setting up microphones around the room. I also have a rotating mic that is, as you talk, I will be going over and making sure that we can hear it, so that we can. We will be transcribing, as you can see; Marci is transcribing. We will be transcribing the entire meeting. At the very end of the meeting, you are welcome to come up to Marci directly and have anything, specifically, for the public record, if you need to, record that today. So we'll have time and opportunity to do that.

So one important item is, also, for my folks on the telephone, I wanted to provide you with my cell phone number. At any point, if you cannot hear or you need me to do a sound check, please don't hesitate to send me a text message. I will receive that and be able to interrupt the wonderful information being shared and make sure that you can hear it. It's important to us that our folks on the telephone can hear. So if you have a way to write down, please take this down: (907) 230-8179. Again, (907) 230-8179.

Periodically, throughout the afternoon, we will be doing what we call sound checks, so I'll just be doing a quick check on the phone. I don't know if anybody's ever -- raise your hand if you've never been on a teleconference before in your life, right? You can't hear. You don't know if you -- you don't who is talking, and you don’t want to interrupt the person, so we’ll be interrupting ourselves so that we can make sure people on the phone can hear.

In order for the folks on the phone to be able to hear and for Marci to take adequate transcription, please do say your name multiple times. I am Josie Wilson. I will be your facilitator today, and I’m providing your housekeeping administrative items. So just kind of make sure you get into the habit of saying your name, again, especially my folks in the back, please. I’ll be using the recorder and coming towards you, but if you could, please, absolutely, say your name multiple times, that will help all of us.

I don’t know all of you by name, first name basis, and I would love to have that done by the end of today, so please, please do say your name multiple times.

I’ve already been alerted to the temperature of the room. And the way I’d like to say it, is we’re Alaskans; we adapt and overcome. So if you need to take care of yourself, we do have water, and the water at the fountain, drinking fountain outside is also very cold. But if you need to take a temperature break, please do so.

All of the information will be able to be provided if you miss something, and we’ll be covering how do you get access to the materials, what information is available on the website. We’ll be covering that at the end of the presentation. So please know that nothing that you miss will be unavailable to you. Okay, so if you need to take care yourself -- I see those of you delayering, and we fully support that to manage your own temperature.

Is there anything else before I turn it over to our Colonel, who is going to provide our welcoming remarks? Is there anything else that I need to cover as far as the facilitator? Anything in the room? I got lots of --

STEVE STRINGHAM: I think we had a new -- a couple (indiscernible -- away from mic). Mayor Ward came in. He’s right here.

JOSIE WILSON: Mayor, would you please introduce yourself?

BRYCE WARD: Bryce Ward, Fairbanks North Star Borough.

JOSIE WILSON: Thank you for coming. Appreciate it. Is there any questions or any other information on the telephone that I need to cover? Marci, is there anything else that you’d like me to cover or anything else administrative?

COURT REPORTER: Just, if they could wait till -- to speak until you bring that toward them, it would make a better record.

JOSIE WILSON: So Marci just said, and you’ll hear me do this a lot, repeating it, so that everyone can hear. Marci just asked if you could just pause a moment for me to be able to get the recorder near you, that would be helpful. All right. And with that, I'd like to introduce and welcome and thank our Colonel Ruga from the U.S. Army Garrison.

COLONEL RUGA: Thank you. And thank you to all of our agency and governmental and community interest organizations that are here today for the Agency Scoping Meeting. For those of you not familiar with the NEPA process, we are just beginning the process here with the scoping period for the Environmental Impact Statem ent. And, really, what we're here to do today with the Agency Scoping Meeting and then, subsequently, tomorrow, with the public scoping meeting, is to listen and take comments from the community, both the -- you as the representative agencies and organizations and governments that have other -- have equities that you represent, as well as the community directly, tomorrow from citizens that have personal concerns. So we'll have opportunity for that.

And so, initially, the question that's come up is, why are we doing this? The bottom line is, it is prudent for us to take a look at long-term energy and heat surety for Fort Wainwright. The power plant is, on Fort Wainwright, about 65 years old, and so in that, we're just exercising what is a prudent course of action to make sure that we have a long-term plan for that. And so part of that is (indiscernible) this process is the heat and energy upgrade Environmental

Impact Statement process.

And so what will happen here is any questions or comments, what we would ask is that if you -- like Josie said, on public record, that make sure that we get the court reporter to be able to put those comments in. Please provide written comment, and if something comes up after the fact that you think about, we have an e-mail address that's over on the big board over here that Ms. Laura Sample will get. And any input that you have, any questions, every bit of that will be incorporated into the Environmental Impact Statement process and will be answered as part of the draft Environmental Impact Statement, which we'll -- as we go over the time, (indiscernible) Laura will get into the details on that. So, again, appreciate everybody being here.

JOSIE WILSON: Thank you. I have to -- I can't not clap. Steve, at this time, we'd love to have you come and give a presentation and get our project overview started.

STEVE STRINGHAM: Hi, everyone. My name is Steve Stringham, and I'm going to follow suit with some of the rest of you and take this suit off. I --

JOSIE WILSON: I'll take it.

STEVE STRINGHAM: Thank you. I am -- as I said, I'm the utilities division chief. By education, I'm a civil engineer. By experience, 40-plus years in federal government, in one capacity or another. Before this job, I was out at Eielson as an engineering flight chief, so I've worked with power plants, now, for 12, 13 years. The Eielson power plant, very similar to this power plant here at Fort Wainwright.

So I'm going to talk -- first, what I'm going to cover is the -- our alternatives, to give you an overview of the overview that -- I'm going to go through the purpose and need here in just a moment, and I'm going to discuss the alternatives that we got. I kind of want to preface it before I get too far.

I'm going to try and get through the briefing. If you got a question, I'm going to ask that you hold it. If you just can't hardly stand it, then go ahead and ask it, but it's very likely that I'll be able to answer -- I may be answering questions as I go along; I'm hoping I can.

I will say that it's kind of a precursor that we're going to be talking about concepts. We're not at the design level yet. We put enough time into this to say these are viable alternatives, but we don't know, quite yet, what we don't know.

So, let's see. They put this in my hand with some (indiscernible). Let's see if I can get it to work (indiscernible) project. This is where we're -- this is Fort Wainwright, the big picture here up on the Tanana. We got the city of Fairbanks, exploded view of Fort Wainwright.

And down in here somewhere, we got a current coal-fired power plant.

Our purpose and need, the Colonel touched on it. We were -- where you live, it’s real cold here in the winter and we have a lot of heat need. We serve about 7,000 soldiers, maybe another thirteen, fourteen thousand other kinds of folks. Heat is a big deal here in January and February. Our mission is to provide a training bed for soldiers and to be able to extend that training out into the world, should we need it. So we got to have power and it’s got to be reliable.

So our need, essentially -- and I’ll try not to read from these slides, too. I -- well, you’ll have a hard time reading, some there in the back, so maybe I will read. We’re looking at this from several different view points. There’s a cost and efficiency viewpoint for this. We don’t have unlimited funds, and we need to be as efficient as we can to save energy.

We are, I don’t know, I often say, about 120 miles south of the Arctic Circle, so this needs to be a relatively reliable alternative that we come up with. We don’t need a lot of risk here.

Talked a little bit about energy efficiency. We have some federal mandates that we’re trying to get, try to reduce energy use and energy costs, as well. We got to comply with the law. We do comply with the law. Any alternative that we select has got to comply with environmental law in a number of different areas. We often think of air quality is the big area in a new power plant or a new heat alternative. And it is, but there are others, and we're going to talk about those, briefly.

And we've also got -- the Army has got some policies that we need to pay attention to on energy security, so we're -- we have to pay close attention to that, as well.

I will cover a little bit. You'll -- a quick stop just for a second, the situation that we've got. We've got a 65-year-old power plant. Well, that would put us into the mid fifties. The plant -- parts of the plant date back to the mid forties. So the major equipment, the boilers and turbines were installed right along with the ones at Eielson in about 1953, '54. So it's the same basic guts that we've been repairing for years.

If you put it in terms of the automobile that you drive, we are, essentially, driving a 1955, '54 Ford out there. And if you're in the Fairbanks area, the only time you see those kind of vehicles is in the summer when it's warm and we've had all winter to work on them and they look real pretty and kind of coax them down the road. Well, you wouldn't think of seeing that kind of vehicle when it's 40 below and there's snow everywhere and ice pack. A lot of technology changes have gone on. So we need to really take account of where we're at, which we have, and we need to move forward to something that's a little more reliable, a little more efficient.

JOSIE WILSON: Steve, before you move on, I just want to do a quick sound check for the folks on the phone. Can you hear Steve's presentation okay? He just completed slide number 4.

SANDY HALSTEAD: Yes.

JOSIE WILSON: Okay, good. And, Wesley?

WESLEY: Yes.

JOSIE WILSON: Great. All right, thanks.

STEVE STRINGHAM: Okie doke. So these are our four alternatives, and I'll go over them. I'll just kind of show them here in this slide, and I'll talk about them in more detail. And I'll start with the last one, the no-action alternative, because, one, we're required to look at not doing anything and what the -- and there are impacts to not doing anything.

But even not doing anything requires a certain expense level. We still got to comply with laws. We still got to be environmentally safe. So no alternative does not mean no money. It might mean some other things like a lot of risk. But, basically, we would keep the coal-fired power plant (indiscernible).

Then we stop -- start up here at the top, a brand new coal-fired plant -- different -- parts of different technology would go into this. Certainly, there would be some requirements, environmentally, with this as well. But same source of fuel, same delivery, more than likely. Very similar to what we're doing. And it would be built very close to the current plant. And there's some pretty good reasons, which I don't, necessarily, need to go into right now, but it would be right next door, so we would build that and any decisions about demolition of the old plant, you know, that's a little bit beyond this particular discussion, but would have to be discussed.

The next easiest jump would be a central -- a new central plant with different technology. This would be a combustion turbine technology. Essentially, think of a jet engine. We're injecting fuel, either ultra low sulphur diesel or possibly natural gas. We may discuss that a little -- in just slight more bit of detail. But a lot of air; this generates a lot of electricity and will generate our heat through its exhaust, so it's combined -- kind of a combined technology, combined cycle, so we would also have tubes that -- heat tubes like in a boiler, basically, heat up and provide our steam.

We would use the same distribution system as we would do with the no-action alternative or the replacement of the coal-fired power plant. So these three all involve the utilidor system. And for those who don't know what that is, essentially, it's an underground steam distribution system. It's where our water and sewer generally reside as well.

So -- and I'm -- this -- I'm trying to go over this quickly, but we'll go into a little bit more detail. Distributed natural gas or we call this to be -- some know it as district heat where we would circle the installation with gas distribution or even ultra low sulphur diesel, possibly, and maybe tanks. I'll leave it at that, because that's probably going to be -- going to require quite a bit more discussion.

Okay. 5, it's working so far. New central plant. As I said before, still coal (indiscernible), still the power plant, how many boilers it might be. Might be -- we currently have six boilers. It might be less than that; it might be more that. We don't know. We're not in design yet. And this would use, as I said, same fuel delivery by rail. Probably, there are some new things that, once we get into design, but I would say that you'll probably see some sorbent injection here for PM 2.5 considerations, so this would look slightly different, but very similar in kinds of people that it would take to operate, very similar in how we would provide for our heat outside, as well. We would still be providing our own electricity here with this, still turning turbines (indiscernible), as well. I think that covers it, this level of detail.

All right, so next slide.

JOSIE WILSON: We're on slide number 7 for those of you on the phone.

STEVE STRINGHAM: Slide number 7, so the dual fuel, I think I said it, ultra low sulphur diesel. So sulphur is -- for the environmental folks, sulphur being a precursor component for PM 2.5. Ultra low sulphur diesel offers about the same emission benefit that natural gas does. Natural gas has next to no sulphur in it and put in a little sulphur so you can smell it, but very low sulphur content.

So either one would work pretty well here. We might have some issues to consider in how the fuel is stored. We have some requirements that have so much fuel available to us. If it's gas, we're probably not going to store great quantities of natural gas, because of the considerations with the safety. But that's a design level detail that we don't have yet.

The ultra low sulphur liquid is more easily stored, but that would have to be produced. That's -- we're trying to supplant 200,000 -- 220,000 tons of coal, the fuel, design level details.

A lot of the same kinds of people here may need some retraining in how to operate this new technology. And it, too, would be constructed very close to the existing plant that the distribution that sends all this steam out has to got to be connected the same place, because it -- like the vein in your body, it gets smaller as it goes out into the fingertips and so forth. So we got to put the pump where the biggest lines are at.

Okay, I guess we're doing all right. All right, distributed natural gas. So I don't want to put out anybody's eye. They said that this is a laser, okay. Good. This is pretty basic, so I'm going to spend most of my time on this trying to describe this alternative. So the -- if you can read the legend, I guess what's not up there -- may be a little hard to see, so these are facilities out, normally, in Fort Wainwright. And certain facilities are more importantly listed those as critical facilities in green. And we're going to build a little differently on critical facilities.

You see a red facility, that is a facility that we would construct to send steam out to close confine buildings. And a good example of that might be in housing where you've got a lot of buildings close together, we would build a boiler building there and circulate heat from there out to the close building. Further out, out here, then what we would do would be to construct facility-size boilers in the individual buildings.

And the natural gas line, if we use the natural gas here, would come out -- coming into the installation and then be circulated out to where we have combustion units in these end buildings. The public utility line would work much as it works today. It should be illustrated there to show you it's part of what we're thinking about. We are considering the possibility of putting in installation size backup generation at our current substation for backup power. Because it's just not steam; steam circulates itself in the distribution system, but if you lose power, then you can't circulate that heat within the buildings. So we're thinking about power just about as much as we're thinking about the heat, too.

Critical facilities, now they're a little different. We have backup sources of electricity and heat. So if, in the case where we might have a gas boiler in the current facility, we'd also be able to use a second boiler with fuel, ultra low sulphur fuel in the case that we had a gas construction with some time. So the critical part of what we do can go on. And we just have -- and we have to deal with the rest.

What are you missing here, Steve? I think that covers the integrative (indiscernible) that alternative. And so the construction -- the constructability, how these lines run, how big the boilers are, that's well beyond what we're doing right now. Those are questions that are going to take me more time and consideration depending on what alternative is selected. It's kind of a ladder; you're climbing a ladder of understanding. We're not that far up on the ladder yet.

Okay. And the no-action alternative, the first one we started with, pretty much we're doing what we're doing today. We get -- do the rules to live by and how we operate. Well, we get them from the state or federal government. We've got to abide by the law like everybody else. So that means with construction, then so be it; we'll do it.

I did not check my time. Hopefully, we're not --

JOSIE WILSON: You're doing great.

STEVE STRINGHAM: -- too far off.

JOSIE WILSON: I've got you; you're doing great.

STEVE STRINGHAM: We're doing great? Okay. So these are the areas, environmentally, that there -- we will be looking at. I won't go into great detail. I mean, there's some obvious ones here, you know. If you live here, you know all about the air quality situation we've had for some years. This one is -- the socioeconomic part of what we're doing is key, because we are -- if we spend a bunch of money here, then -- and we change technologies, we affect the local economy. We have to find out what is -- how that's going to affect you. And that's a lot of what we're asking for here.

We're really coveting your questions. We want to hear from you about any concerns or questions that you have. And we will be getting -- here, in the year-and-a-half, we will be issuing the draft or findings and many of the questions that we get will be directly addressed. It will all be considered. We'll have a little discussion about that, too. But, like I said earlier, we don't know what we don't know in some cases. And if you don't know, maybe we don't know. So, please, consider giving us those questions, formally. We really can't answer if I -- you know, try and answer now, I might have part of the answer. We really need to give a full and complete answer with the whole team, so give us a little time to do that.

So we don't want to be too loud. We've got to be careful about where we dig and what we dig into. Are we going to affect how people get back and forth to work, about how we're getting back and forth to work, dealing with two (indiscernible) technologies that might provide any types of chemicals or chemical releases or we're not talking about doing any of that, but we're going to take a look at it.

So the other big issue, health and safety speaks a lot to air quality as well. Water and -- and this is kind of a catchall. Sometimes, synergistically, these can have effect together that we don’t understand. So we’re going to take a hard look at that.

So with that chunk bitten off, and maybe chewed just a little bit, anybody have any questions for me so far? Justin?

JUSTIN HOGREFE: When they -- with the three action alternatives, are they all about the same megawatt capacity?

STEVE STRINGHAM: They’re going to have provide what the current need is, so whatever it is that we build is going to have to answer the mission requirement. So, like I said, we haven’t designed. These are just the general direction, but I think you can probably bank that it is going to have be enough, but we’d like to make sure that we capture that, if you help us get a question. Mr. Meeks?

MIKE MEEKS: Mike Meeks, Fairbanks. If you weight energy security over cost, it’s going to drive you a different decision versus if you weight cost over energy deci -- or energy security. Have you made a decision on where the weight is going to go yet?

STEVE STRINGHAM: So your question is that, if I can restate it, so if we view energy security, then without the cost implication, then we could escalate costs; is that what you mean?

MIKE MEEKS: Right. If you -- if just real quick on your four options, if you do -- energy security is weighted heavily, then you're going to probably have a distributed system. If cost is weighted heavily over energy security, you're going to probably have that dual generation system without doing any -- I mean, just rough off the top of the head. So that's going to be really key on how the Army decides to weight it and it should be known up front, pretty early, because that's going to drive a lot of things.

STEVE STRINGHAM: You know, especially, Mr. Meeks, given your background, we would like to get that formal question submitted if you would.

MIKE MEEKS: Okay. That's the one I didn't write down.

STEVE STRINGHAM: Yeah.

UNIDENTIFIED VOICE: You can add it to your (indiscernible).

STEVE STRINGHAM: Yes, sir?

RON INOUYE: I'm Ron Inouye with the Historical Society.

STEVE STRINGHAM: Yes, sir?

RON INOUYE: I'm curious about where the fuel sources would be, obviously, for that second choice that you had. Where would you get the fuel? How would you get it here?

STEVE STRINGHAM: You're talking about -- are -- is your question about natural gas?

RON INOUYE: It's about your dual fuel system.

STEVE STRINGHAM: The dual fuel.

RON INOUYE: And the natural gas.

STEVE STRINGHAM: And the natural gas, okay. Well, the way the federal government works is we look out ahead. We have an agency that does the buying of our energy and we would have to enjoin them in this discussion, so they would have part of the answer. But that's a great question and we would love to answer that, officially, with their help, if you can submit that. And it's a question that we've wrestled with a bit, but we're really working with them. Can I get you to give us that question, officially? We're going to answer these, collectively, sir. So we need a collective discussion to answer that completely.

RON INOUYE: Sure, I think we all want something that's going to be from Alaska to help our economy, and that's going to be a real key issue, too.

STEVE STRINGHAM: Consideration --

RON INOUYE: Yeah.

STEVE STRINGHAM: -- absolutely. Yes.

RON INOUYE: I guess I had a second question about what may be happening out at Eielson. You mentioned that their infrastructure is about the same age. Will they be going through a similar process? And if so, could you do something --

STEVE STRINGHAM: Sure.

RON INOUYE: -- jointly on both bases, simultaneously, to get some efficiency?

STEVE STRINGHAM: You know, we're not really well postured to talk about what they're doing. That's more of a regional discussion, probably, at a different -- a little different level. And I don't have visibility -- we don't have visibility on what they're thinking. They're a little farther out, and it goes without saying. But how they go forward in their infrastructure, they're set up just a little different, too, so, gosh, I'd just be guessing. Mr. Ward?

BRYCE WARD: Bryce Ward, Fairbanks North Star Borough. You had said that you use about 225,000 ton of coal a year at the power plant.

STEVE STRINGHAM: It varies, depending on heat demand and what (indiscernible) demand, yeah --

BRYCE WARD: Okay.

STEVE STRINGHAM: -- back and forth. And right now, it's a little less than that because we have a bit of stockpile, yeah.

BRYCE WARD: Thank you.

STEVE STRINGHAM: Yes, sir. Yes, ma'am?

KATHY MAYO: I came in late, so did you say how many megawatts -- up to how many megawatts you're going to design for?

STEVE STRINGHAM: The current plant is about -- when everything is on and demand is high, about 25 megawatts.

JOSIE WILSON: Can you state your name, again, please?

KATHY MAYO: Kathy Mayo.

JOSIE WILSON: And with which organization?

KATHY MAYO: KMA.

JOSIE WILSON: Thank you. We have a public record, so it just helps us for that. Thank you.

JUSTIN HOGREFE: Yeah, again, Justin Hogrefe with Eielson. With the alternatives, are they set in stone or are there other options that you might be weighing, you know, such as two smaller coal plants instead of one new large one, or possibly a dual fuel CHPP --

STEVE STRINGHAM: Good question.

JUSTIN HOGREFE: -- where you can -- you know, you can maybe burn pelletized cardboard or what not?

STEVE STRINGHAM: Well, that’s exactly why we’re here, Justin. Submit that and we’ll hang a cookie on you. But we have screening criteria that we used. And we have lots of different views of different things. So the screening criteria, one of them, you know, technology; was it mature technology; was it mature technology that would fit, you know, in an Arctic environment? And, of course, cost would be a different one. That particular scenario would have gone through both of those, but I would love to answer that question as a team, if you could give that to us.

JOSIE WILSON: Just to reiterate, this isn't your only opportunity to ask questions. We'll go over some other opportunities, as well. But unless you have any other questions, maybe we can continue on with more of the information, as well.

STEVE STRINGHAM: Thank you very much.

LAURA SAMPLE: Thank you, Steve. So this is Laura Sample, again. I'm the program manager. We have moved onto slide 11 of 15, and this is the NEPA process and Environmental Impact Statement steps. So NEPA -- we've been saying that a lot -- but that is the National Environmental Policy Act of 1969. It was signed into law of January 1st of 1970.

And that is the law that requires us to develop this Environmental Impact Statement, which is the highest level of analysis. And what that does is it allows us to evaluate the potential impacts from a federal action before they take place. And it also provides the public and agency stakeholders, anybody with a concern or an interest in a proposed action, to be able to submit their comments to us, so we can incorporate it in part of our analysis.

And it is a federal statute of -- as well, and if anybody has any other questions about NEPA, I can open it up right now or you can submit them to me later.

But these are the EIS steps that we're following right now for this project. So we identified the need for the project; that was the first step. And this process for us, kicked off in January of this year. And Steve mentioned screening criteria, and how we've looked at a number of alternatives and how we got down to these three action alternatives, and then the no-action alternative. And that came about during the draft initial DOPAA. And the DOPAA is the Description and Proposed Action and Alternatives. And that is how we came to this point to be able to develop this material to present to you today for you to provide your input on.

And on July 22nd, we published the Notice of Intent in the federal register and that started this 30-day public comment period, which ends -- you'll see in several places in the material that you have, it ends on August 21st. And so we want all of you to be able to submit your comments to us before that date.

And we are right here, so today, agency scoping meeting; tomorrow is the public scoping meeting. Josie is going to be providing more information on that. After that, after we take in all your input, all your comments, and we incorporate it into our analysis, we are going to release a draft Environmental Impact Statement to the public and to the agencies. And this is where you'll be able to review our analysis and see how we addressed your concerns and your comments. And then that will be available for 45 day -- a minimum of 45-day public comment period.

We will also have public briefing meetings, much as we are doing right here. After that, and we incorporate further comments that we receive on the draft document, we're going to finalize the Environmental Impact Statement. And once it's finalized, we publish a notice of availability in the federal register, and then that starts a 30-day clock where we just have to hold and wait. And we are looking -- I don't believe that I stated it, but we are looking to release the draft EIS in about June of next year, so we have about 10 months until that is going to become available.

And then we are looking to approve the ROD, which is our decision document -- it's the Record of Decision -- by July of 2021. So don't hold your breath immediately. It's a bit of a long process, but that's critical time for us to be able to conduct the analysis that needs to be done to take a hard look at what these impacts are going to have on the environment on areas that Steve reviewed, but also to socioeconomics into our community as a whole.

Are there any questions on this? All right, easy crowd. With that, I'd like to turn to Josie, again.

JOSIE WILSON: So several of you have asked me a couple questions about, like, these slides have been very helpful;

where do you get a copy of them? This is public information that is available on the website. The website is on all of your fact sheets, as well as we have it on the board. And it's kind of a long one, so just be careful when you type in your keys, but we do have that on all the materials. And a copy of all the posters that we will have at the public meeting and all the information that Steve has presented visually will -- is on the website. So for those of you that are like me, that need pictures, I want to make sure you have that information. As Laura mentioned, we would love to have you submit your formal comment period before August 21st, so that it can be incorporated into the draft EIS.

There are several ways, both you in the room, and if you are providing information to your agencies or organizations, there's several ways that we can receive your information. First of all, as we've had some people already provide us some information, you can hand it to us tonight. We do have a comment box and we'll accept those. You can e-mail them to the e-mail project, the project e-mail; we'll accept those as well. And then, as we mentioned earlier, we have Marci for the verbal comments that you'd like to provide, as well, so we can incorporate that as part of that. You're also welcome to mail, snail mail that to the address, as well.

So are there any questions about how to submit comments or when the comment date or any of that before I go into the public information? Okay.

So tomorrow is our public meeting, Thursday, August 8th. It's an open house from 5:00 to 8:00. You can stay as long as you like or leave whenever you need to. We won't have a formal presentation during that time. There will be welcoming remarks from our Colonel throughout the evening, as well as this is open to any members of the public. So if you have any folks that you want to have this information that you went today, we encourage you to invite them to come tomorrow. It's located at the Carlson Center in the Pioneer Room.

So same information you heard today. There's no necessary -- if you -- there's not anything additional or different. We wanted to provide all the same information today as we will tomorrow for you, but we know that the -- our agencies have a slightly different lens in which you're looking through things, so we want to make sure I have this meeting for you, specifically, and also give you a direct opportunity to answer -- ask questions, as well. But you'll have an opportunity to talk with project team members if you have any other questions. Again, open house tomorrow afternoon.

Some of the things that we'll be providing to the public that you have received already and it's also available on the website, is the project fact sheet. We have a frequently asked questions, the comment form, and then, of course, a copy of the posters is on the website.

Are there any questions or any resources that we can resource you with, at this point, that you have not received? Okay, great. Any other additional questions you may have for those folks in the room? I'll do a quick phone check, as well. Okay, so any questions on the phone? You know, I haven't done a phone sound check in a while. Any questions on the phone? Wesley, do you have some?

WESLEY: No, not at the time. Thank you.

JOSIE WILSON: You're welcome. I think we have a -- is it Sarah?

SARAH: Yeah, part of the --

SANDY HALSTEAD: Sandy. Sandy.

JOSIE WILSON: There's a Sandy and a Sarah. So, Sarah, did I get your name right? Is it Sarah?

SARAH: It's Sarah.

JOSIE WILSON: Okay, Sarah, do you want to go ahead? What questions do you have?

SARAH: I'm Sarah (indiscernible). One of the things that our office is concerned about for the proposed project is that the national historic landmark is quite close, and just kind of wanting to get a feel is -- or even discussed internally, about say the distributed natural gas boiler alternatives and how that was going to be addressed, integrate that into the landmark.

JOSIE WILSON: All right, we're just looking in the room to see who is the best person to respond to your concern.

LAURA SAMPLE: This is Laura Sample, the NEPA program manager. So that concern is going to be addressed during the analysis portion when we develop the draft EIS. So we thank you for that comment, and it has been incorporated for the record. And so we will be focusing on that and we look forward to your review of that analysis when we release the draft EIS for your review.

SARAH: Okay, thank you.

JOSIE WILSON: Wonderful. And, Sandy, did you have anything or any questions that you needed to ask?

SANDY HALSTEAD: I, actually, did have a question. So it looks like alternatives 1, 2, and 4 sit within the boundaries of a (indiscernible) operable unit, operable unit 4. It's hard to tell with alternative -- the distributed alternative; is that alternative 3? The natural gas --

STEVE STRINGHAM: I know what she means, yeah.

SANDRA HALSTEAD: -- distributed one. How many of the -- like, where those would be located, how many of those might be needed?

JOSIE WILSON: Okay, so, Steve, for the record and for our folks on the phone, would you mind just repeating that?

STEVE STRINGHAM: The -- well, the location that we know that we located so far is Fort Wainwright. That's -- we're going to have to take a look at where the heat demands really are and what makes sense to put a distributive plant at -- or to just put in a boiler at a facility. That would be way down the road, but any digging, anything done in an area that would require that kind of environmental review, would get a rigorous review. Does that answer your question?

SANDY HALSTEAD: I think so, yes.

STEVE STRINGHAM: Okay. We'll go ahead and log that as an official question. You'll get an official answer on that from the team.

JOSIE WILSON: Is there anything else, at this point, questions of us? Great. We have nothing else on the phone and nothing else, at this moment, in the room. So a couple of -- just on our formal agenda is to review action items and next steps. The next steps for all of you in the room, is if you have any formal comments or questions, please submit them, again, in the different capacities that we've provided, by August 21st. The action for me is to get ready for the public meeting tomorrow, and welcome you all and anybody else, again, tomorrow for the public meeting.

Laura, is there anything else for next steps or actions that we --

LAURA SAMPLE: No, I would just like to thank you all, again, for attending. And we do value and welcome all your comments. So you do have until August 21st. So please take time if you need to deliberate as to what you'd like to submit to us for consideration in the draft EIS. And Steve mentioned the normal times that, you know, your comments will be answered as a team. And that answer is going to come in the form of the draft EIS, so you're not going to be receiving an e-mail with us saying, in response to your comment submitted at the agency scoping meeting. You will see it within an appendix to the draft EIS, but our answer to you is through that document.

JOSIE WILSON: So as agency representatives, it's really important that you know our key message is, one, the very first one that our Colonel opened with is that the Fort Wainwright Garrison is intending to conduct an Environmental Impact Statement. We are during this -- we are in the scoping process and the formal comment period is August 21st; that's when it ends. So those are some key things you can take away and repeat, and we'd love for you to help us share that as well.

Project Team, is there anything else as far as a key takeaway that we just want to make sure to share?

STEVE STRINGHAM: We appreciate your attendance and questions. This is quite a (indiscernible) process that we need this input, so thank you. It’s very important for the installation.

JOSIE WILSON: With that -- anything else, Colonel, you want to add?

COLONEL RUGA: No.

JOSIE WILSON: With that, have a great day. Thank you for joining us in this lovely, warm tropical weather room. Thank you, everyone on the phone. Have a great day.

(Off record)

(End of Proceedings)

* * * * * * *

CERTIFICATE

UNITED STATES OF AMERICA)
) ss.
STATE OF ALASKA)

I, Marci Lynch, Notary Public in and for the State of Alaska, residing at Fairbanks, Alaska, and Court Reporter for Marci Lynch & Associates, Inc., do hereby certify:

That the annexed and foregoing Fort Wainwright Heat and Electrical Upgrades Agency Meeting was taken before me on the 7th day of August 2019, beginning at the hour of 3:00 p.m., at the Noel Wien Public Library;

That this agency meeting, as heretofore annexed, is a true and correct transcription of the proceedings taken by me electronically and thereafter transcribed by me;

That I am not a relative or employee or attorney or counsel of any of the parties, nor am I financially interested in this action.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 13th day of August 2019.

Marci Lynch

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail

If a coal-fired plant is constructed, will the boilers have the ability to be converted to natural gas if a pipeline / source becomes readily available?

Under the Distributed Natural Gas Boilers option, how will all the boilers/generators effect the air emission program?

Will current utilidors continue to be used under all options?

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Julene May
Email: [redacted] **Phone:** [redacted]
Address: [redacted]
City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

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usarmy.wainwright.id-pacific.mbx.heu-eis@mail

Question: I thought there was a moratorium on new coal-fired plants. Is DOD exempt?

Question: Is Doyon Utilities part of the decision-making team or just significant contributor to the discussion?

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Alison Carter

Email: [redacted]

Address:

City: **State:** **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

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usarmy.wainwright.id-pacific.mbx.heu-eis@mail

DOD has the financial and other resources to develop new technologies for extreme environments. Climate change = more volatile environments worldwide = impacts on mission readiness beyond just alaska. THINK LONG TERM

Areas to be developed:

1. Drawing energy through turbines or other technology from water currents. Chena River + Tanana have current year round.

2. Tidal movement power near Ft. Richardson converted to electricity + sent North through transmission lines.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Alison Carter
Email: [redacted] Phone:
Address: [redacted]
City: [redacted] State: [redacted] Zip: [redacted]

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ENVIRONMENTAL IMPACT STATEMENT

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Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail

Fort Richardson uses landfill methane.
Understand that City of Anchorage burns off unused methane. Invest in infrastructure to maximize use of methane to electricity - send it North on transmission lines

Delta Wind.
Ft. Greely Wind

Methane released from thawing permafrost.

Please invest in R+D for long range solutions

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Alison Carter

Email: [redacted] .com **Phone:** [redacted]

Address:

City: **State:** **Zip:**

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail

I believe NAT GAS De-Centralized solution would be the optimal solution to CHPP Delivery on FTWW, economically & environmentally.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Justin Lovejoy
Email: [redacted] **Phone:** [redacted]
Address: [redacted]
City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT
AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

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usarmy.wainwright.id-pacific.mbx.heu-eis@mail

FWW has an opportunity to enhance the availability of natural gas in the FNSB. The use of gas by FWW would contribute to demand growth and volumes necessary for critical mass and cost savings for all customers.

I encourage a solution which uses natural gas as the primary fuel for FWW needs.

Question

① What is projected average, daily + peak demand required for the gas options.

② How many days of fuel supply will be required for each option.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Dan Britton

Email: [redacted] **Phone:** [redacted]

Address: [redacted]

City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

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usarmy.wainwright.id-pacific.mbx.heu-eis@mail

Really encourage continued education and involvement with the public and utility organizations. Excited to be a part of the process. Personally and professionally, I am a supporter of natural gas options.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Mark Rockwell
Email: [redacted] **Phone:** [redacted]
Address:
City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

[redacted]

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail

What AN EXCITING PROJECT FOR OUR MILITARY AND OUR COMMUNITY! Another EXAMPLE OF OUR MILITARY WORKING WITH OUR COMMUNITY.

I'M A GREAT ADMIRER OF "WIN-WIN" PROJECTS AND this is A SHINING EXAMPLE.

I ENCOURAGE A thorough ANALYSIS NATURAL GAS AS FEED STOCK. IT FILL MANY NEEDS OF this PROJECT.

AS A MEMBER OF the INTERIOR GAS UTILITY BOARD OF DIRECTORS, I PLEDGE MY FULL SUPPORT AND ASSISTANCE. WE ARE WORKING hard to PROVIDE CONFIDENCE IN OUR SYSTEM. IGU WILL grow AND FAIRBANKS, NO. POLE, AT FT WW WILL PROSPER AND BENEFIT BY A ROBUST, SECURE, AND ECONOMIC GAS SUPPLY.

PLEASE KEEP US INVOLVED AND thank you for ASKING

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: GARY WILKEN (BOARD MEMBER - INTERIOR GAS UTILITY)
Email: [redacted] Phone [redacted]
Address: [redacted]
City: [redacted] State: [redacted] Zip: [redacted]

August 8, 2019

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT
AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail

1. Is waste heat given a value?

2. With the community's growing interest in renewable energy, we are seeing more intermittent sources of generation on the grid. GVEA is currently limited in the additional intermittent sources it can handle on its grid. Do any of your alternatives help provide voltage regulation to GVEA.

3. Usibelli Coal Mine has lost its export market. If Ft. Wainwright chooses a fuel other than coal, then does that put UCM in financial jeapordy? Aurora Energy's Coal Plant is at the end of its life. If it, too, shuts down, then what affect will losing both Fort Wainwright and Aurora have on UCM. What becomes of UAF's New Coal Plant? of GVEA's coal plants? Coal is cheapest source of fuel. Wouldn't all of Fairbanks, Healy, and surrounding communities suffer with higher energy cost if ~~for~~ UCM is no longer viable?

4. —over —

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Brent J. Sheets
Email: [redacted] **Phone:** [redacted]
Address [redacted]
City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

4. Assuming energy security is a requirement, why would you choose anything other than coal? LNG is trucked twice as far, Petro star cannot provide enough diesel or naphtha to keep you going. Seems like coal is your nearest fuel supply to me.

Please fold here and tape at bottom for mailing

APPLY POSTAGE HERE

Laura Sample, NEPA Program Manager
Directorate of Public Works
ATTN: IMFW-PWE (L.Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT
AUGUST 8, 2019 | CARLSON CENTER

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One more alternative may be the small scale Coal gasification demo plant. It is a U.S. DOE sponsored project. There are 3 phases to DOE project. Phase 1 was completed in the Spring 2019 for $1.5 million. Cost share was provided by UAF, GVEA, Aurora Energy, and others. The Phase 1 report was a Front End Engineering Design. So the plans are finish, including a construction schedule + Budget. The report can be found at NETL.DOE.GOV. Search for "Making Coal Relevant for small scale applications." The design was done with PM 2.5 in mind.

Phase 2 was just awarded. By the winter of 2020/2021, UAF and its partners will need to raise cost share of about $10 million for a $45M plant, and apply for and acquire all air quality and other permits.

Phase 3, if awarded, will provide construction funds from DOE.

Therefore, I urge Ft. Wainwright to consider adding a 5th Alternative: Syngas/engine combo. If the army can wait another 3 ~~yea~~ yrs, this this ~~will~~ should be "proven" technology. Cost of Electricity, in ~~a~~ the FEED study, estimate at 8¢/kWhr.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Brent J. Sheets

Email: [redacted] **Phone:** [redacted]

Address [redacted]

City: [redacted] **State:** [redacted] **Zip:** [redacted]

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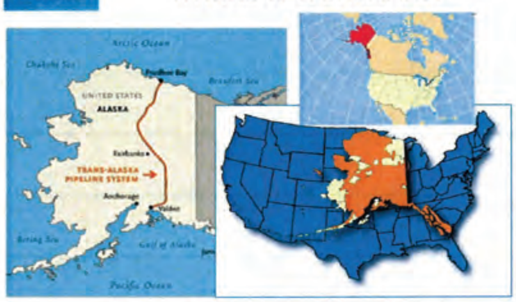
Modular Gasification for
Syngas/Engine Combine Heat and Power Applications in Challenging Environments
(Funding by DOE/NETL Contract DE-FE0031446)

MAKING COAL RELEVANT FOR SMALL SCALE APPLICATIONS

WHERE IS FAIRBANKS?



PROJECT PARTNERS

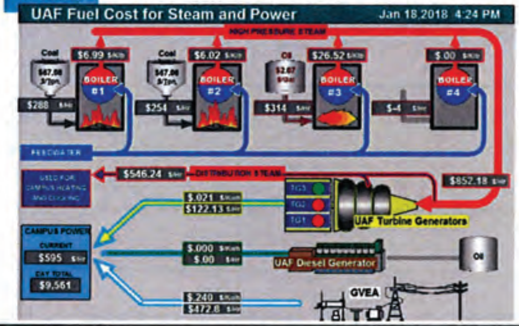
- UAF: Plant & Expertise, Diesel Generator
- HMI: Intellectual Property, Decades Experience
- WorleyParsons: Detailed Engineering, Cost Estimating Service
- Cost Share: Sotacarbo, HMI, UAF, GVEA, Aurora Energy

PROJECT OBJECTIVE

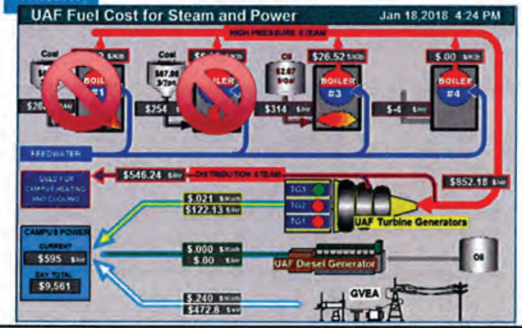
Demonstrate small scale coal gasification to fuel reciprocating engine generators

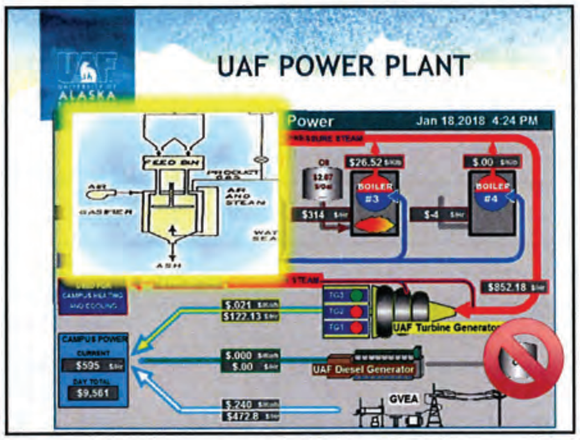
- Cost effective coal generating capacity for small applications
- Provides load following services
- Ideal for islanding systems
- Local jobs

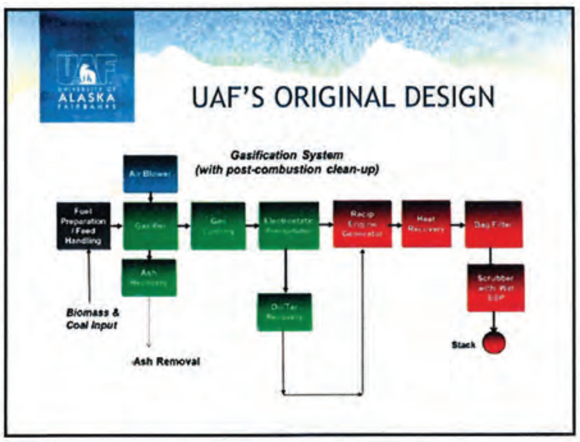
UAF POWER PLANT

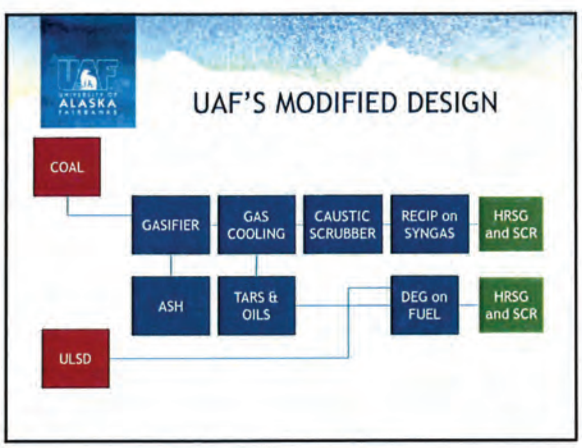


UAF POWER PLANT

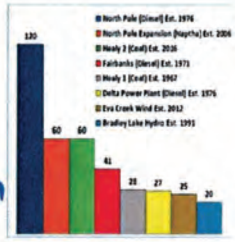



UAF POWER PLANT
Power
Jan 18,2018 4:24 PM
FEED BIN
GASIFIER
ASH
$26.52
$.00
BOILER #3
BOILER #4
$314
$852.18
UAF Turbine Generator
UAF Diesel Generator
GVEA
CAMPUS POWER
$595
$9,561
$.021
$122.13
$.000
$.00
$.240
$472.8


UAF'S ORIGINAL DESIGN
Gasification System
(with post-combustion clean-up)
Fuel Preparation / Feed Handling
Air Blower
Gasifier
Recip Engine Generator
Heat Recovery
Bag Filter
Biomass & Coal Input
Ash Removal
Stack


UAF'S MODIFIED DESIGN
COAL
GASIFIER
GAS COOLING
CAUSTIC SCRUBBER
RECIP on SYNGAS
HRSG and SCR
ASH
TARS & OILS
DEG on FUEL
HRSG and SCR
ULSD

WHERE DOES FAIRBANKS POWER COME FROM?



WHY COAL GASIFICATION?

COSTS FOR REGULATING 27 MWe OF WIND POWER

Fuel	Syngas Project (UAF)	Diesel (GVEA)	Natural Gas (not an option)
Capital Cost	$46 million	--	--
Fuel Costs + other O&M	$114.6/MWh $8/MMBtu	$161.5/MWh $18/MMBtu	$17/MMBtu ($15.20-$20.20)
Wind Regulation Costs (13.6 MW UAF capacity)	$11.8M syngas/engine + tars/oils/DEG	$23.7M (oil)	--
Efficiency, LHV	34%	17.9% (turbines)	--
Simple Payback	<4 years	Base Case	--

THE PROBLEM: INTERMITTENT GENERATION

Eva Creek

"Free" Energy

+

Combustion Turbine

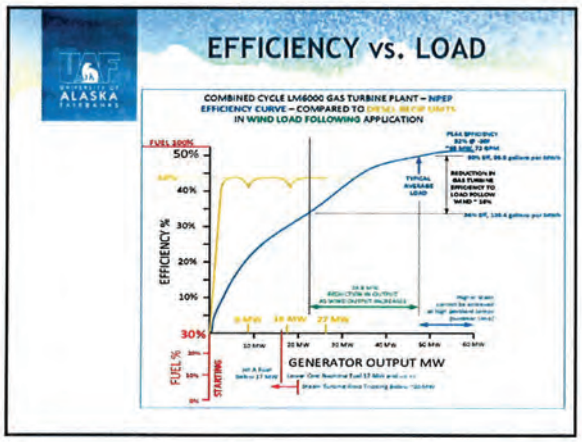
Expensive Energy

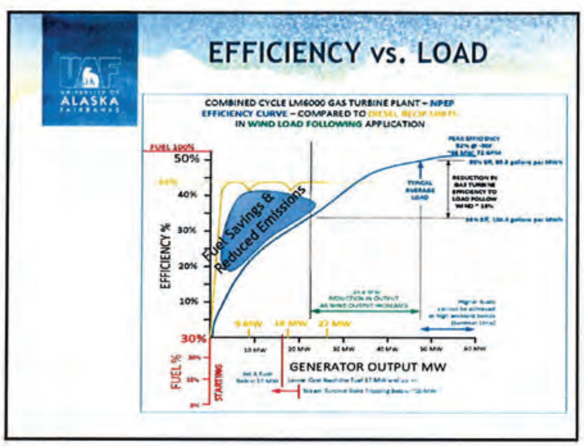
=

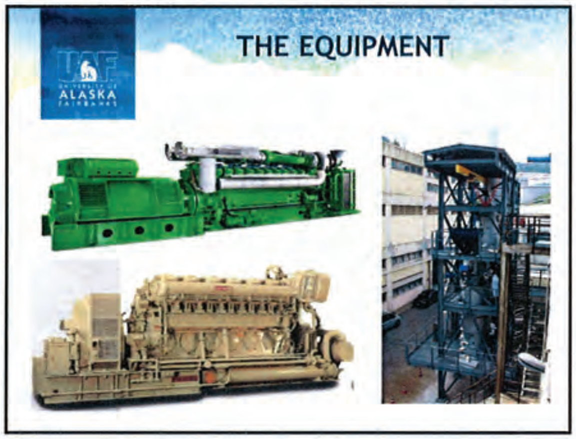
Coal

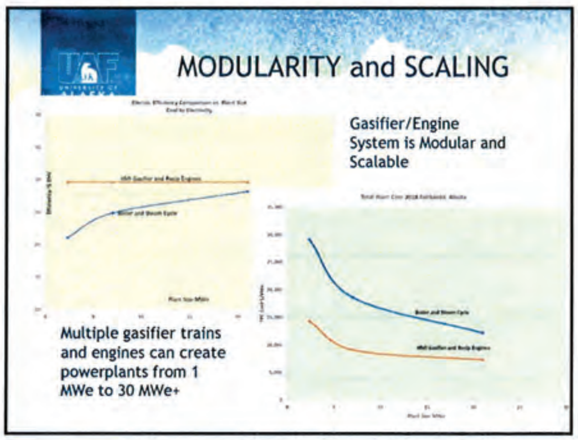
Cheapest Energy

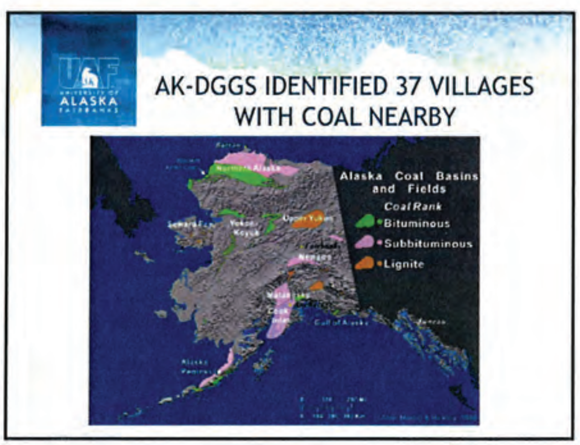

THE SOLUTION:
COAL ENABLING WIND
Eva Creek
Recip. Generator
Coal
Combus tion Turbine
+
Coal Syngas
=
+
Curtailed
"Free" Energy
Cheapest Energy
Cheapest Energy
Expensive Energy


EFFICIENCY vs. LOAD
COMBINED CYCLE LM6000 GAS TURBINE PLANT – NPEP
EFFICIENCY CURVE – COMPARED TO
IN WIND LOAD FOLLOWING APPLICATION
50%
40%
30%
20%
10%
30%
EFFICIENCY %
FUEL %
STARTING
TYPICAL AVERAGE LOAD
27 MW
GENERATOR OUTPUT MW


EFFICIENCY vs. LOAD
COMBINED CYCLE LM6000 GAS TURBINE PLANT – NPEP
EFFICIENCY CURVE – COMPARED TO
IN WIND LOAD FOLLOWING APPLICATION
50%
40%
30%
20%
10%
30%
EFFICIENCY %
FUEL %
STARTING
Fuel Savings & Reduced Emissions
TYPICAL AVERAGE LOAD
27 MW
GENERATOR OUTPUT MW


THE EQUIPMENT
UNIVERSITY OF ALASKA FAIRBANKS


MODULARITY and SCALING
Gasifier/Engine System is Modular and Scalable
Multiple gasifier trains and engines can create powerplants from 1 MWe to 30 MWe+


AK-DGGS IDENTIFIED 37 VILLAGES WITH COAL NEARBY
UNIVERSITY OF ALASKA FAIRBANKS
Alaska Coal Basins and Fields
Coal Rank
Bituminous
Subbituminous
Lignite

RADICALLY ENGINEERED SYSTEM

- Make it work at 5 to 10MWe
  - Economies of Scale working against us
- Make it work at village scale <2MWe
- Integrate with diesel infrastructure

USEFUL IN LOWER-48, TOO!

- Coal plants are best suited for baseload operation because it requires a long period to ramp up and to ramp down
- Syngas/Engine combinations has the potential for making coal a cost competitive resource meeting flexible energy demand and fluctuating generation

BUT MOST IMPORTANTLY ...POWER ALASKA'S INTERIOR




NEXT STEP: COMPETE FOR CONSTRUCTION FUNDING

(DE-FE00031601)

Phases:

I. Team Formation
- $[illegible]M maximum award per team
- [illegible]-10 awards
- UAF team already counts

II. Prepare FEED & Environmental
- $3M maximum award per team
- 4-5 awards anticipated
- UAF's project has FEED already

III. Detailed Design, Construction, and Commence Operation
- $80M maximum award per team
- 2 awards
- UAF's project needs to compete

RISK FACTORS

- Except for the HMI Gasifier, all components are available commercially
  - HMI gasifier components are well understood and documented
- Emission controls could be *the* key factor to be addressed
  - Fairbanks is in an EPA designated "Serious non-attainment area for PM 2.5"

MEET THE TEAM

- Diane Revay Madden, NETL
- Brent J Sheets, UAF
- Rolf Maurer & Team, HMI
- Harvey Goldstein & Team, WorleyParsons
- Chilkoot Ward, UAF
- Frances Isgrigg, UAF
- Russ Steiger, UAF
- Trish Winners, UAF
- Paul Morgan, GVEA
- Pete Saurer, GVEA
- Randy Hobbs, Hobbs Industries
- Alberto Pettinau, Sotacarbo

CALL ME SOMETIME

Brent J Sheets
[redacted]

[redacted]

http://pdl.uaf.edu/

Comments by Justin Hogrefe; [redacted]; Submitted: 18 Aug 2019

Below are my comments for the proposed CHPP upgrade project at Fort Wainwright, AK

1. Consider an alternative where two coal-fired central heat and power plants (CHPPs) are used. With this alternative, the electrical and heat generation capacities would equal the proposed single coal-fired CHPP. Potentially one CHPP could be located next to the current CHPP and the other could be on north post, similar to the past arrangement of two CHPPs on post.
   - Calculate volume of water consumption and waste-water generation and the impacts on the water-table and outfall streams.
   - Will moisture in the exhaust effect air quality/visibility in the winter? Will ice-fog be generated?
   - Consider that resiliency will be increased/strengthened by this two-CHPP alternative. Strong resiliency is needed in this region of extreme cold.
   - Project the price and availability of coal for the next 50 years. Does Usabeli have adequate coal reserves?
   - Was is the effect on air quality? Even though the new boilers will be subject to New Source Performance Standards (NSPS) emissions requirements, will they have less emissions than the current old boilers? A high number and prolonged periods of boiler startup and shutdown (periods of increased emissions) could mean that emissions rates would remain the same as present. How many periods of boiler startup and shutdown are predicted/anticipated and what is the total time duration of the startup/shutdowns?
2. Consider an alternative where two smaller multiple fuel-fired CHPPs are used. With this alternative, the electrical and heat generation capacities would equal the proposed single coal-fired CHPP. Potentially one CHPP could be located next to the current CHPP and the other could be on north post, similar to the past arrangement of two CHPPs on post. The fuel could be coal, ultra-low-sulfur diesel (ULSD), natural gas, or refuse-derived fuel (such as pelletized cardboard/paper) and would use boilers.
   - Calculate volume of water consumption and waste-water generation and the impacts on the water-table and outfall streams.
   - Will moisture in the exhaust effect air quality/visibility in the winter? Will ice-fog be generated?
   - Consider that resiliency will be increased/strengthened by this two-CHPP alternative. Strong resiliency is needed in this region of extreme cold. Resiliency is further increased by making each CHPP capable of firing multiple fuel. If one fuel becomes unavailable, then there are others that can be used.
   - Evaluate the benefits of reusing waste cardboard by palletizing/combusting in the CHPP versus discarding it.
   - Evaluate the air emissions of all proposed fuel. How do the potential air emissions compare to current air emissions?

- With ULSD, how would the diesel reach Fort Wainwright? If trucks are utilized, how many deliveries per day would be needed, versus what the current diesel delivery is?
- Since no coal would be used with this alternative, what is the cost savings/increase of the other fuel?

3. Consider an alternative where photovoltaic cells/solar panels and battery storage bank are utilized, either as an augment to the one or two CHPP alternatives, or as a decentralized alternative, where they either augment or fully supply the installation's electrical needs. With this alternative only electricity would be produced by the photovoltaic panels, not heat, so boilers would still be needed. The boilers could be central or distributed across the installation.
   - Calculate cost/benefit of the materials needed. What is the lifespan of photovoltaic panels and deep cycle batteries?
   - Calculate the average long-term cost of electricity produced versus paying the off-base utility.
   - Calculate the mission risk of being dependent on a non-Department of Defense cooperative/company for electricity.

DOYON UTILITIES LLC

[redacted]

Received 8/21/19
3:25 pm
M. [illegible]

August 21, 2019

Laura Sample, NEPA Program Manager
Directorate of Public Works
ATTN: IMFW-PWE (L.Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

SUBJECT: Environmental Impact Statement Addressing Heat and Electrical Generation and Distribution Upgrades at Fort Wainwright, Alaska

Dear Ms. Sample:

Doyon Utilities, LLC, as Owner and Operator of the Central Heat and Power Plant at Fort Wainwright, Alaska, hereby submits comments for consideration during the scoping review associated with the Environmental Impact Statement Addressing Heat and Electrical Generation and Distribution Upgrades at Fort Wainwright, Alaska, as published in the Federal Register. 84 Fed.Reg. 140, July 22, 2019 at 35106.

The Central Heat and Power Plant meets air emissions standards.
Doyon Utilities ("DU") notes that the Supplementary Information published in the Federal Register contains the following material misstatement: "[The CHPP] is failing to meet air emissions standards[.]" This is inaccurate.

DU has owned and operated the plant for more than 11 years. During that time, DU has received one (1) notice of violation; that NOV concerned a maintenance issue that occurred during a source test. The issue was identified during the source test, the boilers were taken off line immediately, the items were repaired immediately, and the CHPP passed the source test all within a very short period of time. DU successfully implemented Boiler MACT by 12/31/2016, as required.

There is no factual basis for the statement that the CHPP fails to meet EPA or ADEC air emissions standards, or that DU operates in violation of its Title V Air Permit. DU requests the statement be withdrawn as it is untrue and injurious to our operations and standing with regulators.

DU has undertaken the most extensive review of generation and distribution options for Fort Wainwright.
DU is a utility regulated by the Regulatory Commission of Alaska that provides heat and electric generation and distribution services on Fort Wainwright. As a regulated utility, DU must prudently operate infrastructure and provide safe, reliable utility services on the installation. DU is aware it operates one of if not the oldest coal fired Central Heat and Power Plants in the country. DU recognized the importance of developing a heat and energy strategy

that will provide compliant, reliable, sustainable, and resilient heat and energy to the installation in the future. Accordingly, in 2017, DU engaged Black and Veatch to advise DU with respect to potential options to address the operational and regulatory challenges of the CHPP.

Black and Veatch is one of the world's top global engineering, procurement, consulting and construction firms specializing in infrastructure development for energy, environmental, and government interests. Black and Veatch engineers considered our existing infrastructure, and took into account the unique Alaskan operating environment, including impacts to the environment, energy availability, and commodity supply. The Black and Veatch Study ("B&V Study") is comprehensive and provides a well-informed perspective with regard to future heat and energy options for Fort Wainwright. The B&V Study, provided by DU to U.S. Army and Fort Wainwright officials, should be afforded great weight during this EIS process given it was prepared before the process began, was prepared by experts in the field, and has been cited in EIS-referenced materials.

The B&V Study considered current DOD and Army policies and directives, an assessment of existing energy infrastructure, and an assessment of future energy needs and expected environmental and regulatory requirements. A broad selection of energy options were considered, including coal, fuel-oil, natural gas, biomass, solar and nuclear. Three energy options were selected as the most viable for more detailed evaluation and comparison, including a Coal Central Heating and Power Plant (Option 1); a new Central Heating Plant using dual fuel combustion (Option 2); and decentralized heat with electricity purchased from the grid (Option 3).

B&V Option 1: Coal Central Heating and Power Plant. THIS OPTION VARIES FROM NOTICE OF INTENT OPTION 1. This option utilizes <u>existing</u> central plant infrastructure to generate heat and electricity and distribute heat throughout post via utilidors, and includes required replacements and modifications to meet environmental compliance demands. This Option enables continued operations, capital investment, operations and maintenance, and required repairs or upgrade costs. This Option proposed a phased approach, with the initial phase to conduct required repairs and upgrades to meet compliance requirements, and second phase 9-12 years later to include a circulating fluidized bed boiler and a 30 MW steam turbine generator that will increase the capacity of the CHPP. Due to the critical need for heat during the winter, a secondary (redundant) 300,000 lb/hr steam generation system is also included in the scope for this option. An air quality control system will be added in the flue gas system to comply with all EPA requirements, including those anticipated under the Serious State Implementation Plan (SIP).

Advantages:

- This Option has the lowest PV cost of the three options discussed. Option 1 is projected to cost $270 million less than Option 2, and $929 million less than Option 3. SOURCE: B&V Study, Table ES-1.

CO 19-075

- Coal provides high fuel resiliency as it has been a proven fuel for 60 years, promises more than 100 years of supply and allows for three months of storage on site.
- Coal is the least expensive fuel available in interior Alaska and there is opportunity to further lower the cost. The Army previously had a longer-term contract for coal. However, the Army currently has a short term (three year) coal purchase contract; this results in a rate per ton higher than the rate charged elsewhere for contracts with a longer term (for instance, the cost per ton of coal delivered to Eielson Air Force Base). A longer-term contract would secure a better price. Additionally, under the terms of DU's 50-year utility services contract with the Army, the Army may authorize DU to purchase coal directly, further extending the term of a coal purchase contract. Because DU is reimbursed its costs without markup, all savings for a longer-term coal contract would be passed directly to the Army. There is precedent for this approach. At Joint Base Elmendorf Richardson, DU purchases landfill gas for its generation plant directly from the vendor, and then recovers the cost, with no markup, from the Department of Defense under the terms of its 50-year contract there.
- Backup steam boiler capacity is available with six boilers, while only four are required in the coldest periods of highest steam demand. DU may operate five boilers during the coldest periods to allow for heat redundancy.
- High power resiliency with on-site power generation in parallel with GVEA for fully redundant power sources.
- Continues to support the use of utilidors providing heat within preventing freezing of domestic water and wastewater piping.
- Continued use of utilidors maintains possibility for other longer-term technical options developed in the future.
- Coal is the most stable fuel available in interior Alaska. Diesel fuel pricing is volatile. Natural gas is not yet available in sufficient quantities in the interior, and the stability of availability and pricing is unproven. Because heat and electric are key to the mission at Fort Wainwright, the risk with another fuel supply must be carefully weighed.

Disadvantages:

- Condensing steam turbine generators lower CHP thermal efficiency and power.
- This option relies on aging plant which may require replacement before other long lead time options become economically viable.
- Air quality control equipment is required to reduce plant emissions to satisfy the State of Alaska and federal Environmental Protection Agency requirements. However, the cost of these requirements has been included in the NPV considerations discussed below.
- Reliance on coal will not increase demand for natural gas in the interior.
- Availability of natural gas at a reasonable cost (less than \$12.82/MMBtu) will impact the advantage of coal over natural gas.

B&V Option 2: New Central Heating Plant Using Dual Fuel combustion. THIS OPTION TRACKS WITH NOTICE OF INTENT OPTION 2. This option replaces the existing coal plant but uses the existing utilidors to distribute heat. This option consists of a dual-fuel combustion turbine generator (CTG) and a heat recovery steam generator (HRSG). This technology produces electricity and steam simultaneously from the same combustion process. During the winter when steam loads exceed the capacity of the HRSG, boilers will supplement the heat recovery steam to provide enough steam to meet heating demands. This option uses ultra-low sulfur diesel (ULSD) as the primary fuel, but would be equipped with a dual-fuel burner so natural gas can also be fired if it were to become available in sufficient quantity. This combustion equipment includes a selective catalytic reduction unit to reduce emissions and satisfy EPA requirements.

Advantages:

- Better load (power and steam production) and alignment (higher energy efficiencies)
- Provides demand for natural gas in Fairbanks area
- Utilizes existing utilidors to distribute heat (distributed heat supports water distribution and wastewater collection piping systems located within utilidors)

Disadvantages:

- Air construction permit would be required. Additional challenges would be encountered as a result of the Fairbanks area PM2.5 Serious Non Attainment designation.
- High fuel cost of ultra-low sulfur diesel (ULSD) drives higher annual O&M costs than Option 1 – Coal
- No adequate supply of natural gas (either as trucked LNG or a pipeline source) exists in Fairbanks

B&V Option 3: Decentralized Heat and Power. THIS OPTION TRACKS WITH NOTICE OF INTENT OPTION 3. A completely decentralized energy system that solely generates heat. This option consists of individual boiler systems that serve individual building or co-located buildings. Without electricity generation on post, all electric power loads would be served by purchasing power from Golden Valley Electric Cooperative (GVEA). The primary fuel for this system is ultra-low sulfur diesel (ULSD), with possible future conversion to natural gas were it to become available in sufficient quantity. One large fuel tank for large quantity storage is included in addition to local fuel tanks to supply the individual boilers.

Advantages:

- The approach could be implemented over a period of time.
- The B&V Study identified 546 facilities that could be installed and converted in phases. However, the current coal fired CHPP would need to be in service until all phases were completed.
- The Army could implement by installing boilers that serve groups of buildings – particularly in the housing areas. However, the CHPP would need to be in service until all phases were completed.

Disadvantages:

- Most expensive option (highest operations and maintenance costs).
- Most difficult of the options to permit. Alaska regulations do not provide an exemption based on the individual size or purpose of units. Permit exemption requirements are based on the aggregate potential to emit from all of the units included in a project. Given the number of units required for this Option, it may be infeasible for the project potential to emit (PTE) in a distributed heating scenario to remain under the 10 tons per year (tpy) exemption threshold, even with the possible emissions netting as described in the sections above.
- Risks safe operations of water distribution and wastewater collection systems. Currently, potable water and wastewater pipelines are routed within utilidors heated by steam heat distributed from the existing CHP. Decentralizing heat would remove steam from these utilidors and risk freeze up. It is standard utility operations in Fairbanks to heat distributed water; the other water and wastewater utility in Fairbanks heats water to avoid freeze ups of its distribution system.
- Not a resilient option. If GVEA fails to supply power to post, only systems with emergency backup generators on post will remain functional. Further, if power to the installation is lost, each individual boiler will lose pumping capabilities so heat will also be lost. For redundancy of power supply, further backup power equipment will need to be added.
- Barrier against longer-term technical options such as small modular nuclear.
- Drives additional costs to maintain heat within existing utilidors to support water distribution and wastewater distribution.
- Decentralized heat would require extensive ground disturbance activities. FWA contaminated soil is extensive throughout the installation. This option would require EPA/ADEC approved contaminated site plans, 3rd party onsite monitoring during excavation activities, soil sampling of excavated and remaining soils, and ultimately contaminated soil disposal management.

On a total cost basis, B&V Option 1, a refurbished Centralized Heat and Power Plant, is the most cost-efficient option, and decentralized heat with purchased power is the most expensive option.

The B&V Study identified the comparative costs of the projects as scoped earlier in these comments. The B&V Study considered the up-front capital costs as well as Operations and Maintenance costs over a 30-year period. The results of the financial model showed Option 1, refurbishment of the existing plant using coal as the fuel, as the recommended option based on the lower overall 30-year present value (PV) cost. Option 2, a new centralized duel-fuel capable plant, was the next most favorable option, with a PV cost 23% higher than Option 1. Option 3, a decentralized system, has a PV cost of 70% higher than option 1, but presents other significant vulnerabilities that ruled it out as a feasible course of action.

It should be noted the greatest savings determined by the B&V study is in the low cost of coal relative to the other fuel alternatives of Ultra Low Sulfur Diesel (ULSD) and Liquified Natural Gas (LNG). Doyon Utilities believes a coal price more favorable than the current price paid by the Defense Logistics Agency may be achieved with negotiation of a long-term contract. The economic modelling also changes if LNG were to become available in sufficient quantity and at substantially lower price than is currently projected.

Notice of Intent Option 1: New Coal Fired Central Heat and Power Plant

DU recognizes that the EIS has solicited comments with respect to a new CHPP, and DU has provided information about refurbishing the existing CHPP. B&V did not consider the replacement of the existing coal fired CHPP with a new coal fired CHPP because the cost of a new plant would be higher than refurbishing the existing plant and ensuring air compliance. Although the cost of a new plant would be higher than refurbishing the existing plant, a new plant would not result in operational advantages over refurbishing the existing plant according to the B&V Study.

Conclusion

Doyon Utilities is the installation's electric and heat provider and is responsible to ensure safe, reliable utility service. DU recognizes heat and electricity is mission critical on Fort Wainwright. DU is committed to assist with detailed analysis, operational data, and expertise during this process.

Sincerely,

Shayne Coiley
Senior Vice President

cc:
Curt Wexel,
Program Manager, Utilities Privatization – Army
[redacted]

Greg Kuhr,
[redacted]

Jason W. Brune,
ADEC Commissioner
[redacted]

Alice Edwards,
Director, ADEC Division of Air Quality
[redacted]

Cindy Heil,
Program Manager, ADEC Division of Air Quality
[redacted]

CO 19-075

From: Karl Monetti
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject: [Non-DoD Source] Ft. Wainwright Power Plant EIS Scoping
Date: Friday, August 16, 2019 11:17:02 AM

Laura Sample August 16, 2019
NEPA Program Manager at: Directorate of Public Works

Dear Ms.. Sample,

Regarding the EIS scoping for the Ft. Wainwright power plant, I would ask the following issues be taken into consideration;

1; first and foremost should be energy conservation and efficiency. Reducing the demand for energy should be the first item of business. That would include upgrading all lighting fixtures to LEDs, upgrading all appliances to Energy Star equivalent, retrofitting existing buildings to at least five star ratings, and ensuring all new construction is to five or six star levels. This should also include policies that direct personnel to conserve energy at all levels, from their living quarters to their workplaces. Reducing demand allows one to properly size your heating and electrical generation facility.

2; although we have an abundant resource in coal locally, coal has been shown to be among the most highly polluting form of energy production, from the energy it takes to mine and transport it, to the handling of it and the combustion of it.

3; Fairbanks has some of the worst winter air quality in the nation, and part of it is from coal combustion.

4; the U.S. Military has identified climate change as a threat to national security. In that case, the option of continuing to utilize the existing coal powered plant or to build a new one should be the lowest priority on your list.

5; referencing the threat to national security and clearing up our local air-shed to reduce health hazards, I would suggest actively seeking any source of renewable (non-fossil fuel) energy sources, including but not limited to wind, solar, and geothermal.

6; the U.S. Military has a huge budget; Surely some of that can be used to build solar farms on the abundant lands on base and on the south facing sides of the many buildings thereon, and also invest in wind generation nearby. The option of base load geothermal energy should be thoroughly explored, as the Tanana valley is underlaid with a warm water source that could be tapped for continuous renewable power.

7; continued use of coal as an energy source is incompatible with the Paris Climate Accord. Our president has withdrawn us from that accord, but surely the military understands the importance of reducing emissions to try to prevent the 2 degree Celsius increase in world temperatures and its resulting impact on water and crop shortages around the world, leading to geo-political instability.

8; Alaska has abundant renewable sources (wind, solar, base load geothermal, hydro-electric) that could provide a diversified, secure energy source unaffected by interruptions in transportation of fossil fuels such as coal, oil, or natural gas.

Thank you for your consideration.

Karl Monetti
[redacted]

From: Carol Johnson
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject: [Non-DoD Source] Power plant using renewable energy
Date: Thursday, August 15, 2019 8:28:13 AM

Hello, I would like to echo words from Fairbanks Climate Action coalition regarding the importance of renewable energy generation at the new Ft Wainwright power plant.

- Fairbanks suffers from unacceptable and hazardous air quality, caused in part by the combustion of fossil fuels from the region's power plants, including Ft. Wainwright's current coal plant
- Building additional fossil fuel generation—which will last decades—is incompatible with the Paris Climate Agreement and the widespread scientific consensus that anthropogenic carbon emissions must be rapidly decreased in order to keep global warming to at least 2 degrees Celsius
- Alaska has renewable sources—including base load geothermal heat and electricity, as well as wind and solar—that offer a diversified, reliable, inexpensive, and local energy supply

We must lessen our toxic dependence on fossil fuel.

Carol
Sent from my iPad

Quinn, Chase

From: Duffy, Brian [redacted]
Sent: Friday, July 26, 2019 10:24 AM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] HEU EIS/Scope Questions

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Dear US Army Garrison Alaska Team, we have three questions regarding the planned scope/intent for the Heat & Electrical Upgrades initiative, pls:
- Is Doyon Utilities the Privatized Owner for utility systems on Ft Wainwright? If so, which utility systems and does this include the Central Heat & Power Plant?
- Is there a preferred alternative on a centralized vs decentralized end state?
- Is the EIS being done in house or through a contracted effort? If contracted, which firm is performing the analysis?

Thanks in advance for your assistance & we look forward to seeing how we can best assist with this effort! We do currently hold a contract with the USACE Alaska District focused on mechanical/electrical requirements with emphasis on stoker-fed coal fired power plants primarily at locations in Alaska.

Brian P. Duffy, Client Service Manager – Asia/Pacific
STANLEYCONSULTANTS, Anchorage, AK 99515
[redacted] |stanleyconsultants.com < Caution-www.stanleyconsultants.com >

Quinn, Chase

From: [redacted]
Sent: Monday, August 19, 2019 10:31 PM
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA); USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] comment on draft EIS Fort Wainwright heat and power

19 August 2019

Laura Sample, NEPA
Program Manager at: Directorate of Public Works
ATTN: IMFW–PWE (L. Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703–6000

Dear Ms. Sample:

Thank you for the opportunity to comment on the draft EIS for the project to upgrade heat and power production at Fort Wainwright.

Natural gas would substantially reduce PM2.5 emissions below coal, but the supply of gas is not yet secured in pipeline. Thus, at least the short term it would require trucking LNG from distant sources (such as the North Slope, once a supply is secured) or by rail tanker from Cook Inlet. Bulk storage tanks at Fort Wainwright (buried under concrete to reduce military strike risk) would be prudent in the event that 400 mile transportation corridors are damaged by natural events or military strikes.

If coal is used by itself, or as duel fuel with natural gas, I recommend a feed system to the fluidized bed that can also use wood chips to offset a substantive (e.g., 30%) volume of coal. Wood has the advantage over fossil fuels of not being an export commodity, thus not being subject to world market pricing. The Alaska Division of Forestry updated its wood inventory in 2012 to include biomass estimates for energy (as chips, pellets, hog fuel, etc.) for the Tanana Valley, which permits estimates of volume at varying distance from Fort Wainwright. ADOF can provide materials on wood energy, including a study from the 1980s that demonstrated coal volume reduction from using wood chips in the Aurora power plant in Fairbanks. Utilizing local wood from hazardous fuel reductions on post and surrounding areas off post also lessens risk to wildland fire in the urban interface and enhances wildlife habitat to benefit local hunters with wild food sources.

Tom Paragi
[redacted]

Quinn, Chase

From: Tim Jones [redacted]
Sent: Tuesday, August 20, 2019 6:18 PM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Comments on Fort Wainwrights Heat and Electrical Upgrades EIS

Please accept these comments on the Heat and Electrical Upgrades EIS:

I am a former garrison commander of Fort Wainwright and a current executive with Doyon Utilities. Though each of those positions inform my comments, the comments are purely my own and not intended to represent either the US Army or Doyon Utilities.

Of the four courses of action offered in the EIS, I find the distributed heat option, with all electric power provided by GVEA, to place the installation at the greatest potential risk and in opposition to current DOD and Army guidance on resilience. Fort Wainwright, with its CHPP and recent decision by DPW to return Turbine One to service, has the ability to completely self-sustain, using stockpiled coal, for three months or more. The Army has the option to buy energy from GVEA if it believes purchased energy to be more economic, and still have the ability to self-sustain should GVEA be unable to supply energy for any reason.

It is true that for heat the existing CHPP is a single point of failure. By all means, that should be remedied with an alternate heat plant that can provide adequate heat in the event of a catastrophic failure of the existing CHPP or a new centralized plant.

I personally believe that, until a gas pipeline is in place, coal offers the best solution due solely to the installation's ability to stockpile fuel. Alaska's existing transportation and logistics infrastructure is austere and relatively fragile. An interruption of fuel or electricity in the lower 48 can be remedied relatively quickly by switching to another source of supply. That is not the case in Alaska, currently or in the foreseeable future. I strongly urge selection of a centralized plant capable of supplying heat and power for Fort Wainwright's long term heat and power solution.

Sincerely,
Timothy A. Jones
[redacted]

Quinn, Chase

From: Alison Carter [redacted]
Sent: Monday, August 19, 2019 11:35 AM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Comments re: Ft. WW heat and electric upgrades EIS

Thank you for the presentation at the Carlson Center on August 8.
I've been getting into the details and notice that the 4 concepts presented at the open house fall short of both the Installation Energy and Security Policy outlined in Army Directive 2017-07, and the Army Energy and Water Management Program (AEWMP) as outlined in AR 420-1.

Army Directive 2017-07 cited in the Ft. WW EIS poster at:
Caution-
https://home.army.mil/wainwright/application/files/9915/6520/9178/20190805_HEU_Posters_508.pdf
< Caution-
https://home.army.mil/wainwright/application/files/9915/6520/9178/20190805_HEU_Posters_508.pdf
>

Army Directive 2017-07 Installation Energy and Water Security Policy at paragraph 5. b. (1) says, "Assured. . . [r]edundant and diverse sources of supply including renewable energy . . ."

At paragraph 9 it states that the directive is rescinded after publication of updated Army Regulations (AR): AR 420-1 (Facilities Mgmt) and AR 525-2.(Protection Program), meaning that the directive is to supplement AR 420-1.

AR 420-1
Caution-
https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN15517_R420_1_admin_FINAL.pdf < C
aution-
https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN15517_R420_1_admin_FINAL.pdf >
At page 239, says,
Chapter 22Army Energy and Water Management Program
Section IIntroduction22–1. Overview. This chapter prescribes policies, procedures, and responsibilities for the AEWMP . . .
The overall objective of the AEWMP is to ensure theavailability, quality, and security of energy and water for the Army without degrading the environment, missionreadiness, or the well-being of Soldiers (see para 22–5 of this publication).

At page 242 it says,
22–5. Program objectives
Objectives of the AEWMP include—

a. Providing guidance for resourcing utility infrastructure modernization and program execution.
b. Participating in the national effort to conserve energy and water resources.
c. Participating in research and development (R & D) efforts regarding new and improved energy and utilitytechnologies.
d. Implementing the Army Energy Strategy for Installations by—
(1) Eliminating/reducing energy waste in existing facilities.
(2) Increasing energy efficiency in new/renovated construction.
(3) Reducing dependence on fossil fuels.
(4) Conserving water resources.
(5) Improving energy security.
e. Encouraging partnerships with local communities and utility suppliers to obtain power from renewable sources.

<u>My comments and suggestions:</u>
1. The four options presented to the public seem to be responding mainly to the "security" directive, but do not include the other program objectives of conserving resources, R&D regarding new technologies, and reducing dependence on fossil fuels. Although one option presented includes partnering with local utility suppliers (GVEA and IGU) it does not address the renewable sources requirement in AR420-1, chapter 22-5 *e*.

2. "Participate in research and development efforts" (22-5 *c*.) to
(a) use the year-round current of the Chena River to produce electricity (*d*.(3) above);
(b) store the excess heat from the existing power plant to heat buildings and produce electricity instead of using energy to cool the heat "waste." (*d*.(1) above)
(c) capture methane from the borough landfill and vast areas of cleared land occupied by the military as the permafrost thaws.

3. "Reduce dependence on fossil fuels" (22-5 *d*.(3) by installing solar panels on every building and storing the excess summer solar energy for winter use.

4. Explore "partnership with local utility suppliers to obtain power from renewable sources" (22-5 *e*.) by:
(a) working with Delta Wind to purchase wind power if they expand their wind farm.
(b) working with the Fairbanks North Star Borough to pelletize waste paper and cardboard to burn in a manner that does not contribute to poor air quality.

5. Publicize what efforts have been made to "Eliminat[e]/reduc[e] energy waste in existing facilities" (22-5 *d*.(1)). Hopefully, all new construction has used state-of-the-art cold regions energy efficient construction techniques, LED lighting, etc.

Thank you for engaging the local community in this important discussion. I also thank you for past responsiveness to local concerns such as the traffic hazard caused by the old cooling pond associated with the power plant.

Sincerely,
Alison Carter
[redacted]

Quinn, Chase

From: Patrice Lee [redacted]
Sent: Wednesday, August 21, 2019 9:54 PM
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Cc: [redacted]
Subject: [Non-DoD Source] Docket USA-2019-HQ-0001 Fort Wainwright EIS Comments

Comments submitted by:
Citizens For Clean Air
Fairbanks North Star Borough

Patrice R. Lee, Coordinator
[redacted]

To: Department of Defense via Ms. Laura Sample

Dear Ms. Sample,
Citizens for Clean Air is a local group of citizens based in the Fairbanks North Star Borough. We promote clean air and warm homes through education, political action, citizen participation, scientific research and public outreach. We have spent a decade keeping the issue of the Fairbanks North Star Borough's poor air quality at the forefront of important community issues. We have sued the EPA four times to keep legal timelines from being further ignored as we have fought for the health and safety of the community.

Our community, the Golden Heart Community, regards Fort Wainwright and the people who live and work there and in our community to be our neighbors, friends, protectors, and compatriots. We view the health and welfare of the post as a part of the health and welfare of the entire community.

Now is the pivotal time to plan, engineer and construct a new power plant at Fort Wainwright that will employ:
-Cleaner burning fuels such as natural gas and/or propane -Efficient, modern technologies that employ carbon capture and reuse -Best practices and most stringent technologies -Flexibility to include other renewable energy sources such as wind, solar, geothermal, etc.
-Consideration of the impacts of rapid climate change in the sub-arctic -Best health and safety practices that can improve air quality and thus the quality of life for everyone living in the borough

Coal is dirty, outdated, and inefficient. When the health effects of poor air quality are factored in (which they are often not), coal may be one of the most expensive fuels. The coal itself may be inexpensive, however the medical care needed to treat people who are affected by bad air quality (of which coal plays a part) is extremely expensive. Coal ash dumping has its own set of problems. There are no safety regulations in place to deal with this and the practice will only get worse and the ash more prevalent if we don't switch to natural gas, propane, or some combination of the two along with wind, solar, or geothermal sources.

The Fort Wainwright power plant is at the end of its life. Its efficiency may be around 40%. That means that every tax dollar spent at the facility loses 60 cents. That is not economic, and should drive rational decision makers to consider modern efficient, cleaner alternatives.

Build a new heat and power plant at Fort Wainwright. An investment in cleaner natural gas/propane, best technologies, and better health is a prudent choice, a wiser use of money, and an improvement to heat and power security for the important mission of Fort Wainwright.

Quinn, Chase

From: Cathy Walling [redacted]
Sent: Wednesday, August 21, 2019 3:05 PM
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject: [Non-DoD Source] EIS scoping for the Ft. Wainwright Power Plant

Dear Ms. Sample

Please accept my comments regarding the EIS scoping for the Ft. Wainwright Power Plant.

In learning a few days ago about Ft. Wainwright's scoping period deadline of August 21, 2019 to get comments in and only having the period open for 30 days, my first suggestion is to extend the comment period for another 30 days. In the summer many Fairbanks folk are less available to respond to such a request, and extending will allow more opportunities on this very important matter.

In light of Climate Change and the poor air quality in Fairbanks, replacing the existing coal fired power plant should NOT be replaced with another coal fire power plant.

With the military's knowledge of climate change and concerns for global security as a result, here's a change to lead by example and replace this power plant with renewable energies like wind/ solar/ geothermal.

With the immediate problem of very poor air quality in Fairbanks in the wintertime, coal fired power plants being one of the polluters, and Ft. Wainwright being located within the non-attainment area, here's another huge region that lower pm 2.5 emitter sources for heat/power need to be pursued.

Working to make all buildings as energy efficient as possible will reduce the power generation needed, and again be a wonderful way to lead by example.

In learning about the scoping period at the end of the 30 days, I haven't had time to review all the options, yet urge any steps forward to have the priorities of reducing PM 2.5 to enhance air quality and reducing CO_2 to help reduce Climate Change impacts to be the two top considerations for developing a plan.

Thank you,

Cathy Walling
[redacted]

Quinn, Chase

From:	Diane Preston [redacted]
Sent:	Tuesday, August 20, 2019 11:48 PM
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject:	[Non-DoD Source] EIS scoping for the Ft. Wainwright Power Plant

Hello Ms. Sample

I am submitting this comment regarding the EIS scoping for the Ft. Wainwright Power Plant.

A. It is imperative that the scoping take into consideration two significant issues.
1) Climate change and all the infrastructure damage that is already doing to Alaska as well as the identification of climate change as a national security issue.
2) The very real and deadly health issues resulting from the poor air quality in Fairbanks, a significant portion of which is generated by emissions from coal fired power plants.
B. The first action needed is to retrofit Ft. Wainwright buildings, put in energy efficient lighting and appliances and mandate that for any new/remodel of buildings a high level of energy efficiency is required. The military has a built in advantage because of the ability to order personnel to follow energy conservation measures.
C. There should be a thorough investigation of all possible renewable energy sources to include solar, wind, geothermal and hydro all of which are viable in Alaska. Coal should not even be considered as a fossil fuel energy source for a power plant given it's known contribution to health hazards as well as the disposal of coal ash problem.
D. With the vast military budget as well as the recognition by the military that climate change is a security issue which is already costing our community, state and nation vast sums to mitigate, the current cost factor of renewables should not be the determining or driving factor in the decisions about energy for Ft. Wainwright. Factors such as effects on climate and health should be higher priorities than cost.
E. The health of military personnel should be considered and the expense of the treatment for the ailments caused by air pollution needs to be factored in as well. Ft. Wainwright personnel are currently and likely will be impacted by the current air pollution in the Tanana basin.

It would be unconscionable for Ft. Wainwright to build another coal fired power plant at this time when the climate crisis is getting worse and far faster than scientists previously predicted. Renewables are a viable energy source even here in Alaska and we must as a society act now and quickly to counter the release of CO2 into the air. The military can lead the way in training personnel in renewables and demonstrating how clean energy can power a base.

Thank you for considering my comments.

Diane Preston (life long resident of Fairbanks)
[redacted]

Quinn, Chase

From:	Patrice Lee [redacted]
Sent:	Wednesday, August 21, 2019 8:37 PM
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Cc:	[redacted]
Subject:	[Non-DoD Source] EIS Testimony-Ft. Wainwright

To: The Department of Defense, via Ms. Laura Sample

Fort Wainwright is an integral part of the Fairbanks North Star Borough and is valued for the community of fine people who work and live there, those who contribute to, diversify, protect, raise their families, and recreate in our fine city. At this time Fort Wainwright's aging, undependable, inefficient heat and power plant must be replaced. The Fairbanks North Star Borough is in a "Serious Non-Attainment" status with the EPA for air quality with the highest wintertime levels of PM 2.5 in the United States. Our community is fighting to reduce air pollution as well as other types of pollution and every move forward must be one that involves cleaner energy sources, and more efficient technologies. It is estimated that the Fort Wainwright plant is extremely inefficient. It may be running as low as 40% efficiency and that is not economic. The taxpayer money is 60% wasted if efficiency is 40%. That is not sustainable, not a best practice, and a needless waste. Coal is dirty, inefficient, outdated, and cannot help our community meet attainment and compliance with the Clean Air Act. Coal ash is overwhelming parts of the community, contaminating large areas and regulatory based safety precautions are not in place to deal with coal ash. Moving forward, the community will be best served if coal, as a solid fuel, is eliminated from the heat and power production at Fort Wainwright. We need to reduce air pollution right now for the health of everyone living in the borough. The military must not constrained in their mission because we are beyond maximum pollution limits. Build a new, efficient, technologically sound power plant that uses natural gas/propane. Combined heat and power is a good technology to consider. Make the plant as flexible as possible to employ/mix renewable energy sources such and wind, solar, and geothermal. Our community needs an Energy Policy so we can come into concert with opportunities to build new, efficient heat and power infrastructures. We're not there yet, but if we were, I'm quite sure that moving to natural gas/propane as a cleaner, more efficient fuel would not only improve many aspects of life in Fairbanks, it would help anchor best practices as we move forward.

Rules Committee
Chairman
Resources Committee
Vice-Chair
State Affairs Committee
Vice-Chair
Health and Social Services Committee
Vice-Chair
Member - Legislative Council
Member - Committee on Committees
Member - Legislative Ethics Committee

31th Alaska State Legislature

Senator John Coghill

Session Address:
[redacted]

Interim Address:
[redacted]

www.alaskasenate.org

August 19, 2019

Laura Sample, NEPA Program Manager
Directorate of Public Works
ATTN: IMFW-PWE (L.Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

Re: Fort Wainwright Heat and Electrical Upgrades – Environmental Impact Statement (EIS)

Dear Program Manager Sample:

This office attended the EIS meeting at the Carlson Center on August 8, 2019, and provides the following comments:

1. Can natural gas be supplied affordably in the timeline suggested?
    a. Where will the natural gas come from if there is a decision to build a new dual-fuel combustion turbine generator CHPP? Cook Inlet? Or another area?
    b. Although coal may not be as "politically correct" as natural gas, the supply is known. A stable coal supply exists around Healy. Most agree that there's enough coal to be mined in the area for hundreds of years. <u>A stable supply of energy is a huge benefit for powering a national security installation.</u>
    c. A secure supply of natural gas is not known at this time. How much natural gas storage capacity will be needed?
        i. Will it be a "just-in-time supply?"
        ii. Are national security interests served by a non-stable supply of natural gas?
        iii. What will be the mode of transportation? How viable is that?
        iv. Can the need be met?
    d. If the dual-fuel combustion turbine generator CCHP has to rely on ultra-low sulfur diesel, what are the effects (both pro and con) when compared to coal?
        i. What are the costs?

   e. Does the natural gas provide the economic residential or industrial heat required by Fort Wainwright?

2. If the Army is considering a change from a coal-fired central heat and power plant (CHPP), there must be thorough consideration about how that change will affect the surrounding economy in the Interior.
   a. If coal is no longer used as a primary fuel source on Fort Wainwright, that will likely have a long-term detrimental effect on Usibelli Coal Mine. Noteworthy: Usibelli's portfolio largely consists of in-state customers now that coal exports to world-wide customers have diminished.
      i. Usibelli is a large employer in the Interior. How many employees will be affected if coal no longer is used on Fort Wainwright?
      ii. What about other collateral consequences? The health of the coal mine has a direct correlation to charitable giving to many causes throughout the Interior. Those causes include: youth services, scholarships, and, importantly, the University of Alaska.
   b. What is the effect on the Alaska Railroad?
      i. The Alaska Railroad transports the coal. If less coal, how much will the railroad decline?
   c. One wonders the difference between the scrubbed coal stack CO_2 emission over a natural gas CO_2 emission, when comparing the cost benefit ratio. Are the "emission effects" substantially similar? In other words: Is it worth it?

Please feel free to call my office at any time if you'd like to have further discussion on any of these issues. My point-of-contact is Chad Hutchison. Mr. Hutchison's direct line is [redacted] His e-mail is [redacted]

Sincerely,

Alaska State Senator John Coghill

Quinn, Chase

From: Kathy Mayo [redacted]
Sent: Wednesday, August 21, 2019 7:40 PM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Fort Wainwright Heat and Electrical Upgrades EIS COMMENTS

Please consider another option for providing power generation to the Post:

Advanced Nuclear power, either micronuclear or Small Modular Reactors. This technology has been under development for decades and is now ready for commercial use. This technology holds the promise of carbon-free, clean, affordable power.
Deployment in Alaska will enable testing leading to greater understanding of how this technology can be used at other remote sites, such as military facilities outside of the grid-system.

--
Kathy Mayo, Principal Manager
Kathy Mayo and Associates
[redacted]

Fairbanks North Star Borough

Mayor's Office
www.fnsb.us

August 21, 2019

Laura Sample, NEPA Program Manager
Directorate of Public Works
ATTN: IMFW-PWE (L. Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

Submitted by e-mail to: usarmy.wainwright.id-pacific.mbx.heu-eis@mail

RE: Fort Wainwright Heat and Electrical Upgrades, Environmental Impact Statement, Scoping Comments

Dear Ms. Sample,

The Fairbanks North Star Borough administration and staff (Borough) encourages and supports Fort Wainwright's (FWW) efforts to upgrade the heat and electrical facilities at FWW along with the Environmental Impact Statement (EIS) to evaluate potential environmental impacts. As you are aware, the Fairbanks area was designated as a serious non-attainment area for fine particulate ($PM_{2.5}$) in 2017. Several stakeholders including the Borough, the State of Alaska Department of Environmental Conservation (ADEC), the U.S. Environmental Protection Agency (EPA), FWW, industrial point sources, and community members have been involved in the planning process to develop the Serious State Implementation Plan (SIP). A draft Serious SIP has been released, the public comment period has closed, and ADEC is currently evaluating the additional public input. With such a complicated and multi-faceted issue it is imperative that all stakeholders work collaboratively to ensure the Borough's air quality is improved and protected. The public comment periods during the EIS process provides a platform for all interested stakeholders to comment, and the Borough is pleased to offer the following comments which primarily address the air quality analysis.

Comment 1:
The Borough encourages the ambient air quality analysis to go beyond screening methodologies, e.g. emission inventory comparison and screening modeling analysis, to include dispersion modeling analysis for all alternatives. The Borough also encourages the modeling analysis to contain at minimum both primary $PM_{2.5}$ and the precursor pollutant sulfur dioxide (SO_2). If possible the ambient air quality analysis should be completed with a photochemical modeling tool such as the Community Multiscale Air Quality Modeling CMAQ system which is utilized for SIP analysis.

Comment 2:
A General Conformity analysis is required for any part of the project occurring in nonattainment or maintenance areas for criteria pollutants. Section 176(c) of the Clean Air Act (CAA) requires federal agencies to ensure that federally approved or funded projects conform to the applicable approved SIP. Such activities must not: cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in an area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. FWW is located inside the $PM_{2.5}$ non-attainment area and within the carbon monoxide CO maintenance area boundary. The Borough encourages the EIS to address conformity with the currently federally approved SIPs as well as the Serious Area SIP which is in

the final process of approval. The Borough encourages the no-action alternative to evaluate $PM_{2.5}$ and SO_2 controls necessary to comply with the Serious SIP. The Borough encourages that the action alternatives be evaluated with pollution controls necessary to comply with non-attainment New Source Review permitting requirements.

Comment 3:
The $PM_{2.5}$ issues in the Borough are primarily a winter season phenomenon. The Borough encourages the air quality impact analysis to include construction emissions, and to separate those emissions on a seasonal basis. With construction activities in the Borough primarily occurring during the summer months, seasonal breakouts of construction emissions will accurately portray the impacts.

Comment 4:
The National Environmental Policy Act (NEPA) requires the lead federal agency to consider the potential cumulative impacts of proposals under its review. Cumulative impacts may result when the environmental effects associated with the proposed action are superimposed on or added to impacts associated with past, present, and reasonably foreseeable future projects, regardless of what agency or person undertakes such other actions. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant. The Borough encourages the analysis to assess cumulative impacts for not only air quality issues, but also other socioeconomic impacts that the project may have.

Comment 5:
In 2018 an Air Quality Stakeholders brought together a broad cross-section of the community including various interests in air quality, home heating and the economy. The Stakeholders final report included a list of 53 individual recommendations to improve air quality in the community. Should air quality impacts be unavoidable, the Borough encourages FWW to consider mitigation measures from the final Stakeholders report. The final Stakeholders report can be found at:
http://fnsb.us/transportation/AQDocs/Fairbanks%20AQ%20Stakeholder%20Process%20Final%20Report.pdf

The Borough is fortunate to have a military installation such as FWW within the community and we sincerely appreciate the opportunity to comment on this document.

Sincerely,

Bryce J. Ward
Mayor

cc: Alice Edwards, ADEC Air Quality Director
Glenn Miller, FNSB Transportation Director
Nick Czarnecki, FNSB Air Quality Manager

Quinn, Chase

From:	Lisa Baraff [redacted]
Sent:	Wednesday, August 21, 2019 4:24 PM
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject:	[Non-DoD Source] Fort Wainwright Heat and Electrical Upgrades Environmental Impact Statement: Scoping Comments
Attachments:	July_22_2019_Member_Book_V2_CO2 reduction presentatation Cost vs Emission Rate figure.pdf; FNSB Resolution 2019-29.pdf

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Laura Sample
NEPA Program Managerat: Directorate of Public Works
Fort Wainwright, AK99703–6000
email: laura.a.sample.civ@mail.mil < Caution-mailto:laura.a.sample.civ@mail.mil > .

Re: Fort Wainwright Heatand Electrical Upgrades Environmental Impact Statement--Scoping Comments

Dear Ms. Sample,

Thank you for theopportunity to submit scoping comments on the Fort Wainwright Heat andElectrical Upgrades EIS. Public participation is an integral part of the NEPAprocess. To that end, my first comment is to request a comment periodextension. I understand you advertised in the requisite locations, however,many of us were unaware of the 30-day scoping period until two days prior to thepublic meetings when information was shared by Fairbanks Economic DevelopmentCorporation, followed by a story on KUAC. I further shared the announcement andlinks to our members and partner groups, among whom there is great interest inthis EIS. Additional time would garner further comments during this step in theprocess.

The followingincludes items for USAG Alaska to consider during alternative development, impactanalysis, and while drafting the EIS:

1. <u>Includeenergy efficiency and weatherization upgrades and requirements for existing andnewly constructed infrastructure</u>.Meeting mandated energy efficiency requirements is listed as a “need” for thisproject. It is also included as part of implementing the Army Energy Strategy(p. 242, publication AR 420-1: (1)Eliminating/reducing energy waste in existing facilities. (2) Increasingenergy efficiency in new/renovated construction. (3) Reducing dependenceon fossil fuels. (4) Conserving water resources. (5) Improving energysecurity.). Reducing energy needs and consumption through improved weatherizationand energy efficiency are among the most cost effective and forward thinkingactions DOD can take toward addressing energy security, fiscal, and resilience concerns.The cheapest energy is the energy not needed.
2. <u>Concernswith building a new CHPP (or the No Action Alternative) and continued reliance oncoal.</u>
    a. Thisalternative warrants serious investigation prior to moving forward. Understandingthat coal is among the cheapest and most readily available fuel sources ininterior Alaska, fuel source costs should not take precedence over health,climate, and other environmental costs. UAF’s new CHPP faced similar issuesduring the evaluation stage and was moved forward as the best alternative dueto lack of LNG or other viable options. The plant has been beset by problemsand is still not functional, despite “celebrating

completion of the CombinedHeat and Power Plant" nearly a year ago (August 29, 2018). GVEA's Healy 2 powerplant has also had numerous, serious set-backs.

b. CO_2emission levels from coal combustion are of serious concern for air quality inthe Fairbanks North Star Borough (FNSB) and for the need to reduce carbonemissions in light of the current and impending impacts of climate change. GVEArecently pledged to reduce their carbon emissions by 26% by 2030. The teamevaluating means to that goal presented an update at the July 22, 2019 GVEAboard meeting. Included was a graphic that shows cost vs carbon emissions byGVEA power source (see attached pdf). Although coal is among the cheaper fuelsources (along with wind and hydro), it has some of the highest emission rates.The climate change crisis dictates excluding coal as a fuel source.

c. Additionalconsiderations include plans for coal dust deposition and potential air andwater quality concerns.

3. Alternativeto Build a New Dual-Fuel Combustion Turbine Generator CHPP. Feasibility analysis needs toinclude the realistic likelihood of an adequate, reliable, and consistentsupply of LNG. Currently, the AKLNG project is still a "pipe dream" with innumerableand substantial financial and environmental hurdles to overcome (the publiccomment period for the DEIS for that project is open until October). The IGUstorage tank project off Peger Road and LNG trucked up from south central isthe nearest to completion; their storage facility in North Pole is currentlynon-existent, although may have funding.

4. Adda renewable portfolio alternative, either as a stand-alone or combinedalternative. Iunderstand that a viability analysis was conducted prior to the NOI for thisEIS and that the screening process eliminated an alternative with renewables. Themost recent, publicly available report I found regarding a review of Fort WainwrightPower Plant alternatives was published in 2003 (Central Heating and Power PlantAlternatives Review: Fort Wainwright, Alaska. ERDC/CETL TR-03-11). I urge USAG Alaska to think out of the box andwork with local experts (such as Renewable Energy Project Alaska, Alaska Centerfor Energy and Power, and the Cold Climate Housing Research Center) to reconsiderrenewables and develop alternatives that utilize wind, thermal, solar, biomass,or other options. Dependence solely on fossil fuels (coal, LNG, diesel) is nolonger viable, especially when powering for decades into the future. I have nodoubt that there are reasonable alternatives not yet considered.

5. Includethe viability report in the DEIS along with a clear analysis and description ofall alternatives considered and not carried forward.

6. Climatechange considerations must be analyzed and included. Some were addressed above.

a. DODconsiders climate change a national security concern, including as recently asJanuary 2019 (see "Report on Effects of a Changing Climate to the Department ofDefense" at Caution-https://climateandsecurity.files.wordpress.com/2019/01/sec_335_ndaa-report_effects_of_a_changing_climate_to_dod.pdf < Caution-https://climateandsecurity.files.wordpress.com/2019/01/sec_335_ndaa-report_effects_of_a_changing_climate_to_dod.pdf >).It, therefore, behooves DOD to dramatically reduce fossil fuel use.

b. Resourcesbeing evaluated include Air Quality and Greenhouse Gases. Climate Change, beyondGHG emissions, must also be analyzed, including each alternative'scontribution to climate change and the impacts of climate change (e.g.,permafrost thaw, increased rain events, etc.) on each alternative.

c. Asnoted above, GVEA pledged to decrease carbon emissions by 26% by 2030. Newpower plant considerations ought to align (or, better yet, improve upon) thatproposed reduction.

d. TheFNSB Assembly passed Resolution 2019-29 (see attached) on July 25, 2019. Itestablishes a joint Climate Change Task Force to develop a climate action plantfor the FNSB. Fort Wainwright, as a major landowner and population center inthe FNSB, should consider collaborating with and contributing to the task forceand working closely with the Borough to best align energy needs with climate changemitigation.

7. Projectarea determinations for impact analyses. The DEIS should clearly define the areas considered forimpact analysis, particularly for air shed and water shed impacts. Both are subjectto "downstream" effects, and climatic and atmospheric conditions that extendbeyond proposed power plant footprints and the Fort Wainwright propertyboundaries.

Thank you, again, forthe opportunity to submit scoping comments for this EIS. I look forward tocontinued engagement as the EIS moves forward.

Regards,

Lisa Baraff

--

Lisa Baraff
(she/her/hers)
Program Director

Northern Alaska Environmental Center
[redacted]
Caution-www.northern.org
< Caution-http://www.northern.org/ >

< Caution-https://www.facebook.com/northerncenter/ > < Caution-https://twitter.com/NorthernCenter > < Caution-https://www.instagram.com/TheNorthernCenter/ >

By: Leah Williams
Marna Sanford
Andrew M. Gray
Shaun Tacke
Liz Lyke
Geoffry Wildridge
Christopher Quist
Matt Cooper

Introduced: 07/25/2019
Substituted: 07/25/2019
Adopted: 07/25/2019

FAIRBANKS NORTH STAR BOROUGH

RESOLUTION NO. 2019 – 29

A RESOLUTION ESTABLISHING A JOINT CLIMATE CHANGE TASK FORCE TO DEVELOP A PLAN TO ADDRESS CLIMATE CHANGE IMPACTS ON THE FAIRBANKS NORTH STAR BOROUGH

WHEREAS, Warming temperatures, heavier summer rains, shorter snow seasons and increasing rain on snow in winter are currently impacting and as these trends continue will increasingly impact the health and wellbeing of current and future Fairbanks North Star Borough (FNSB) residents and poses increasing economic and safety challenges including wildfire, pests and diseases, flooding, hazardous travel conditions, reduced winter recreation and transportation opportunities, and damage to infrastructure; and

WHEREAS, The overwhelming threats from climate change to our environment, infrastructure, economy, and residents' health require that we take mitigation and adaptation measures to address these growing impacts; and

WHEREAS, Climate change will impact the interests of the FNSB, but will disproportionately affect communities already facing disparities in socioeconomic and health outcomes, and as such, climate action is necessary to advance social equity; and

WHEREAS, Efforts to reduce carbon emissions and adapt to climate change impacts are likely to benefit FNSB residents through cost savings, stable energy prices, steady jobs and local revenues, social equity, improved air quality, better public health outcomes; and

WHEREAS, A climate action plan is the best platform to outline urgently needed comprehensive mitigation and adaptation strategies to address a changing climate; and

WHEREAS, The Fairbanks North Star Borough Sustainability Commission recently adopted a resolution calling for action on the climate change crisis, requesting that the Assembly and the administration create a climate action plan addressing these concerns; and

WHEREAS, The FNSB's participation is critical, but as a second class borough, the FNSB's authority is constrained by powers that it can exercise in order to address climate change impacts, for example, in how it constructs and maintains its infrastructure and conducts its operations; solid waste programs, including recycling and other waste reducing measures; water pollution control and storm water management; transportation systems and land use powers that can encourage increased use of public transit and non-motorized transportation; economic development, by expanding locally grown products; and land use controls that encourage smart growth; however,

WHEREAS, a second class borough has land use authority, and adopts a comprehensive plan for guiding the physical, social, and economic development of the borough; and

WHEREAS, The Interior Issues Council Climate Change Task Force performed work in accordance with Borough Assembly Resolution No. 2007-40, and issued a report dated January 10, 2010; efforts should be made to use this report and other Borough planning documents in assessing the next steps in this process.

NOW THEREFORE BE IT RESOLVED that the Fairbanks North Star Borough administration shall facilitate the formation of a Joint Climate Change Task Force, including borough staff, residents, and community partners such as the University, for the purpose of identifying tasks and developing a Climate Action and Adaptation Plan which includes actions allowable by a second class borough to address climate change impacts on the Fairbanks North Star Borough; and

NOW THEREFORE BE IT FURTHER RESOLVED that the Climate Change Task Force will hold its first meeting no later than November 15th, 2019; and

NOW THEREFORE BE IT FURTHER RESOLVED that the first objectives of the Climate Change Task Force are to identify funding needs for the development of a Climate Action and Adaptation Plan and to identify a path towards securing external funds to meet those needs; and

NOW THEREFORE BE IT FURTHER RESOLVED that upon plan completion, the Assembly shall review the draft tasks and plan for consideration and adoption of a Climate Action and Adaptation Plan for the Fairbanks North Star Borough.

PASSED AND APPROVED THIS 25th DAY OF JULY, 2019.

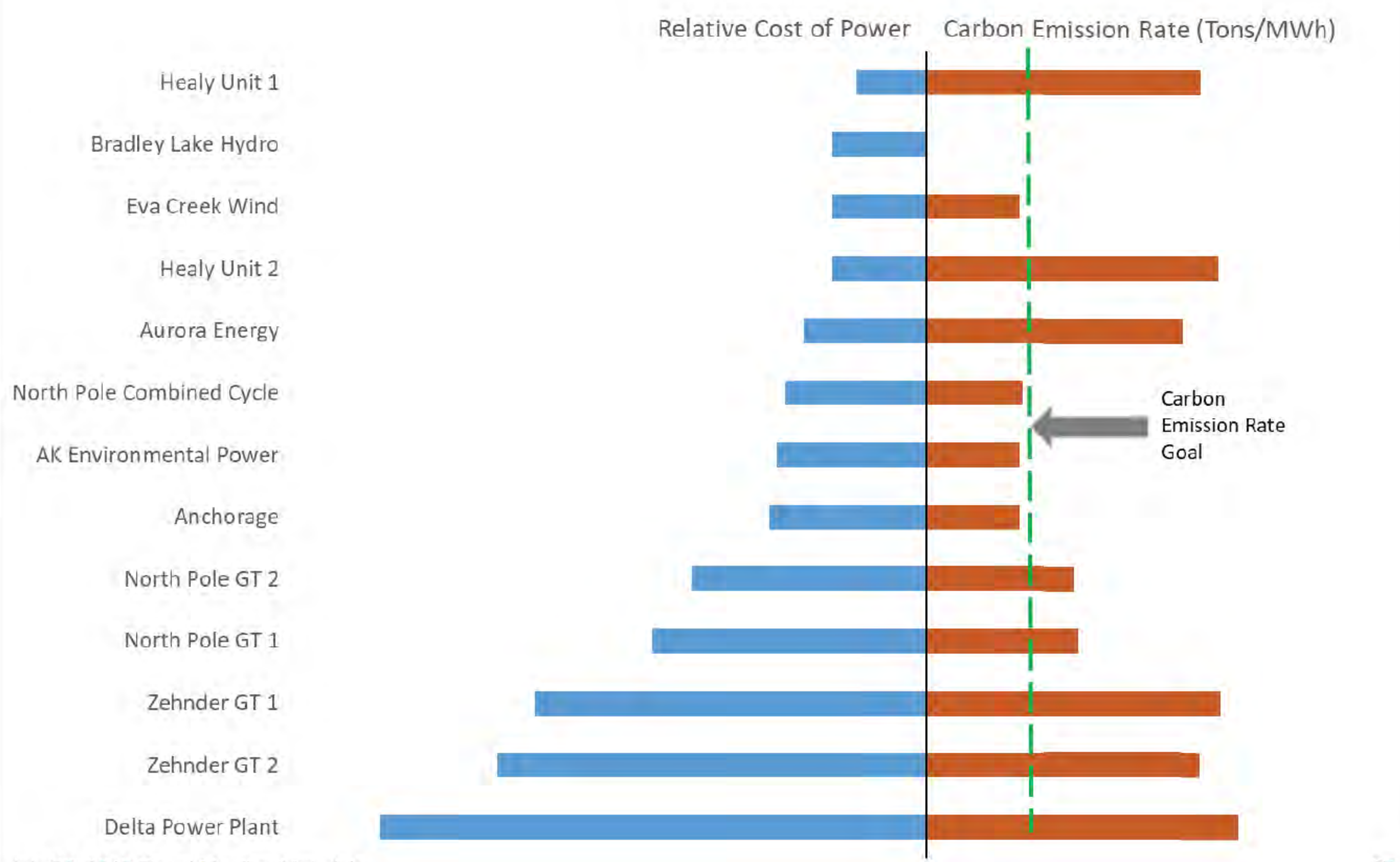
Matt Cooper
Presiding Officer

ATTEST:

April Trickey, CMC
Borough Clerk

Yeses: Williams, Quist, Wildridge, Sanford, Gray, Lyke, Tacke, Cooper
Noes: Lojewski

Cost Versus Carbon Emission Rate



Quinn, Chase

From: Joseph Byrnes [redacted]
Sent: Wednesday, August 21, 2019 4:15 PM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Fort Wainwright Heat and Electrical Upgrades

Laura Sample, NEPA Program Manager
Directorate of Public Works
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

Ms. Sample,

Thank you for the opportunity to provide comments for the EIS scoping for the Fort Wainwright Heat and Electrical Upgrade.

Of the alternatives considered, construction of a new coal-fired CHPP would be preferred. Coal powerplants are demonstrated technology in the Interior with local expertise and a reliable supply source of fuel. All of the necessary infrastructure to provide coal to Fort Wainwright is already in place with Usibelli Coal Mine and the Alaska Railroad.

During the Agency Scoping Meeting, I was curious why a dual-fuel natural gas and coal generator was not considered as an alternative. Having a natural gas and coal plant would use reliable sources of fuel locally. If technologically feasible, it seems that would be a preferred option.

Regards,

Joe Byrnes
Chief of Staff
Office of Representative Bart LeBon
[redacted]

Quinn, Chase

From: Brent Sheets [redacted]
Sent: Wednesday, August 21, 2019 4:34 PM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Fort Wainwrith Heat & Electrical Upgrade EIS comment
Attachments: Final Report as submitted to OSTI.pdf

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

I am writing to suggest that you consider a fifth option for re-powering Fort Wainwright, namely, small scale coal gasification to operate a reciprocating engine generator (such as a diesel engine). The U.S. Dept. of Energy funded a $1.8 million study conducted by the Univ. of Alaska Fairbanks, with cost-share provided by GVEA (the local utility that also sells power to Fort Wainwright), Aurora Energy (another Fairbanks utility), and others. It was completed in the Spring 2019, and, based on the results of that initial study, DOE is sponsoring a $1.4 million continuation effort at UAF aimed at acquiring the air permits to enable the building of the coal gasification plant. After you examine this option, and see how close it is to commercialization, I believe you will think it deserves closer examination.

The design presented in the attached Techno-Economic analysis is based on commonly available commercial components, with the exception of the gasification unit, which is near commercial ready. The DOE-funded project could lead to construction of a demonstration plant on the campus of UAF as soon as 2021, with operations 2022. If successful, it could be deemed "commercial" in 2022 or 2023, which I presume makes it eligible for your consideration. Therefore, I encourage you to read the attached, paying close attention to Chapter 10 which is a cost and efficiency comparison between conventional coal and the syngas/engine system described herein. (This report should be available on the DOE/OSTI website, but I was unable to locate it as of this writing.)

The point of the demonstration plant is to move it into the commercial market. By the end of Phase 2 (Sept 2019 through Dec 2020), UAF will need to complete its NEPA effort and acquire all air emission permits to operate the plant in the non-attainment area, as well as raise 20% cost share to build the plant, estimated at $46 million. While costs for your four options have not been presented, as far as I have been able to find out, I believe any of the four options you have identified will have either significantly higher capital costs, operating costs, or both.

I encourage Fort Wainwright to remain with coal as its primary fuel source. First, coal is the most "local" of any of the fuel options. LNG is trucked in from Anchorage, or perhaps from the North Slope some day. Even if a pipeline were to be built connecting Fairbanks to one of the natural gas basins, it would become a target for vandalism. (While working as a DOE Federal employee, I assisted in two different threat assessments against TAPS and am aware of its past attacks and its vulnerabilities. A natural gas pipeline would become a similar target.) Fuel oil would similarly have be trucked into the area, or the local refinery would need to expand. Even if the local refinery expands, TAPS remains a vulnerability. Natural gas and diesel are still expected to cost about $20/MMBtu, barring any market disruptions. Coal is delivered by rail, but if the rail is disrupted, it is near enough to truck into Fairbanks, plus there are multiple routes available, the Parks Hwy, Denali Hwy (summertime), or the Glen Hwy if worse comes to worse. Further, it is not subjected to the huge market swings that plague it's fossil-based cousins.

Second, please consider the consequences on the economic viability of the Usibelli Coal Mine if Fort Wainwright switches to another fuel source. If UCM becomes economically nonviable (and I believe it may be close to that already, but you should check to be certain because my information may be incorrect), then what impact will its closure have on UAF, Eilson AFB, and GVEA because each installation currently relies upon coal as its most economic fuel source. Indeed, I would encourage you to review UAF's decision to invest in a new coal-fired power plant. Even though it had the largest capital cost, over the entire life of the project the decision should pencil out, plus they chose to remain with coal due to fuel certainty. With the PM2.5 issue, it is entirely possible Aurora will be forced into retrofitting their plant with expensive emission devices. They have publicly stated they will close-up before investing in that because of the expense. So, if Fort Wainwright switches away from coal, and if Aurora goes out of business, then the question is whether UCM will be able to remain economically viable. If not, then UAF, Eielson AFB, and GVEA will all be forced to close their coal plants and to invest in some other power source for its electricity.

Third, Fort Wainwright has a 30-day (or more, I cannot recall) supply of coal on hand. Please consider how easy it is to store that much solid fuel on base, as opposed to a similar quantity of fuel oil or natural gas. And I have already mentioned how much easier it might be to deliver coal if some natural disaster disables a pipeline or takes out more bridges.

Finally, over the course of completing the attached Techno-Economic analysis, I have come to the conclusion that the syngas/engine combination presented has the greatest potential to provide the lowest cost heat and power while meeting the area's strict air emission requirements. Because its components are well understood and widely used, with the exception of the gasification unit, it will be easy to maintain, and replacement parts should be widely available.

Thank you for your consideration.

Brent J Sheets
[redacted]

Quinn, Chase

From:	stonecastle [redacted]
Sent:	Tuesday, August 20, 2019 9:47 AM
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject:	[Non-DoD Source] Ft Wainwright Power Plant

Dear Laura Sample,

I would like to submit my comments regarding the potential future power plant. As a member of the air quality stakeholders group and the Borough Air Pollution Control Board I have researched various new technologies .

Considering cost and availability of fuel coal makes the most sense. Until now, it has been the most detrimental to the air quality. A new technology has been developed by Dr. LS Fan and others through their research in the coal fields of West Virginia. Currently, a distinguished professor at Ohio State University where his mission is to disprove the notion that "there is no such thing as clean coal !" Dr. Fan has developed and patented a process called chemical looping. It is an exothermic reaction without ignition which approaches almost zero emissions.

Originally, the carbon dioxide was captured to sequestered back into the earth , so no carbon footprint. Recently, Dr Fan developed another process to use the CO2 to make syngas. This makes this system cutting edge technology.

The Department of Energy became aware of this technology and provided a $117 million grant to build a test plant in Wilsonville Alabama. This was several years ago and it worked great. Since that time Dr. Fan has been fine tuning the design and process. It would behoove you to check out this cutting edge technology.

I will try to give reasons why this should be used. (1) Cheapest fuel source would be coal and it is available locally. (2) Be able to use the existing area where the current power plant is located enabling the hook up to the utilidor system currently in place. Save the long and costly delays of trying to find a new location. (3) Chemical looping uses coal, but other materials such as calcium and iron. There is a limestone deposit north of Fairbanks that Dr Metz from UAF has been trying to develop for years. This would create an economic need and eventually create jobs. Iron could come from the various gold mines in the form of black sand. Ft Knox should have tons of it. Otherwise, utilize all the iron scrap metal here that is to expensive to ship back to the lower 48.

(4) The near zero emissions has to be the most compelling reason. The future regulatory costs would not be as stringent without emissions. The plant would be more like a refinery , but completely contained. A well maintained system would not be dealing with continuous pollution issues.

(5) While being a flagship for other military bases around the country and world, the goodwill generated here in the North Star Borough would be enormous. Being a good partner to the community while helping to solve the air quality problem just makes sense. Whether you can convince EPA to consider this as part of an offset expenditure I will leave to you. That being said the possibility of help finacially from other Federal agencies is something that should be investigated because of the overall ramifications .

In conclusion the near zero emissions and being able to use much of the existing infrastructure such as the location, rail line, utilidors , etc. has to be considered as a reason to not only to investigate, but use chemical looping as an alternative. Thank you for your time and consideration.

Respectfully submitted,
Dan Givens

Stone Castle Masonry

Sent via the Samsung Galaxy S10e, an AT&T 5G Evolution capable smartphone

Fort Wainwright Heat and Electrical Upgrades Alternatives

I support Building a New CHPP Alternative.

1. Reliability of CHPP – the greatest advantage,
2. Abundance - Coal is Alaska's most abundant energy resource. There is more contained energy in Alaskan coal than in all the combined oil and natural gas in Alaska.
3. Affordability - The use of diesel and natural gas are volatile fuels and have experience extreme fluctuations in price. Coal has maintained a very stable price during the past several decades.
4. Known Technology - State of the art developments within the electrical power generation industry and new technologies have significantly improved coal fired power plants environmental characteristics burning process; i.e. bag houses, emission control devices, etc.
5. The world situation is unstable and uncertain. Coal maintains an important position as a low-risk, relatively secure commodity in today's volatile environment.
6. Natural disasters and terrorism are not likely to impact the distribution and availability of coal in comparison to other world energy sources.
7. Ft Wainwright needs to be its own self-contained installation and not connected to any outside grid. Energy security is a big deal. Coal offers energy security through the ability to stockpile the coal (e.g. +90 day supply). The equivalent storage for NG or diesel would be huge tanks with lots of potential liability; single points of failure. If Ft Wainwright relies on importing power, that it makes it difficult to secure energy needs.

Respectfully,

Karl Gohlke

[redacted]

Quinn, Chase

From: Miller, Chris [redacted]
Sent: Tuesday, August 20, 2019 1:05 PM
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] Ft Wainwright Power Plant

In my opinion Replacement of the existing coal plant with a modern coal plant is appropriate for the following Environmental reasons.

1. UAF just went through this same deliberative process and concluded that a modern coal plant with fuel supply from the interior was the best bet for 50 years.
2. We don't have a fixed natural gas supply. Unless the project is going to build a pipeline with at least two different sources it seems poor to rely on the trailer/train car LNG system for reliability of source. The coal, delivered by rail and truck, has had decades of experience. The rail LNG is has not been proven long term, and we need a much higher quantity that is being shipped today which may not really work.
3. Emissions of modern coal plants are manageable. Gas plants make emissions as well.
4. Buying electricity from the 'Grid' is buying coal and fuel oil electricity anyway, that does not benefit from the distributed steam system which makes things more efficient. Electricity only production is only about 33% efficient and modern CHPP can be 60% efficient.
5. District heat system are reliable and already exist throughout post. Individual boilers at each building have a much higher maintenance cost due to wide variety of equipment that may be installed
6. Small boilers are much harder to regulate and monitor emissions as the sources are spread throughout post.
7. Construction would be required at every building for a boiler connection which could disturb existing contaminated soils.
8. The central power plant already has all power lines and district heat lines running to it. They be reused and upgraded in a methodical fashion each year.
9. IF the CHPPs were all grid tied together the coal fired cost effective electrical generation could be used for the regional needs, and make the local utility rates less.
10. The power plant can be easily designed as a critical facility capable of withstanding design earthquake events. This will be easier than designing many small additions to be seismic stable.
11. One big building is easier to manage that many small plants.
12. Gas fired equipment still produces PM2.5 particles through the non-condensable gases.
13. Steam can be used for cooling equipment to reduce the electrical needs on base.
14. One exhaust source may provide let ice fog potential over the runway as the discharge is high and in one location compared to distributed sources
15. It is easier to improve the ground in one location to avoid liqufiaction potential than it is to improve ground at multiple location in a distrubted system.
16. If a coal to liquid or gasification plant was built to provide a reliable source of gas for the community, a gas plant may make sense.
17. One industrial sized plant should be safer to operate that a distributed system as the operators wll have more specialized training and one work location.
18. The bassett army hospital has a extensive backup system that takes significant maintenance, a distributed system will be similar.
19. The utilidor system exists already and continue to be maintained long term
20. It is easier to physically protect one facility than distributed facililties.
21. It is not easy to store gas, so Fort wainwright will be dependent on the community to provide gas constantly. The coal plant can be an island for over a month without any inputs due to the coal pile.

Quinn, Chase

From:	Phil Wight [redacted]
Sent:	Wednesday, August 21, 2019 11:36 AM
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject:	[Non-DoD Source] Ft. Wainwright Power Plant EIS Scoping Comments

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Laura,

As I resident of Fairbanks and someone personally and professionally concerned with energy use and pollution in Interior Alaska, please accept my below comments regarding the Ft. Wainwright Power Plant EIS Scoping process.

As part of the EIS scoping process, the Army should strongly consider:

- Generating heat and power from as many local renewable energy sources as possible, including geothermal heat and power, wind, and solar
- Options that prioritize reducing load— Efficiency must be part of solution.
- Options that include purchasing renewable energy from our local co-op, Golden Valley Electric Association, and encouraging GVEA investment in additional renewable generation.
- Constructing additional electrical transmission infrastructure—like the proposed "Road belt" Power Line Project connecting Fairbanks, Valdez, and Anchorage—to source electricity from a more resilient grid and matrix of existing and future renewable generation.

With our air quality crisis and the escalating climate crisis, it is absolutely unacceptable for the Army to build another coal plant or to build a LNG facility that will lock us into decades of further greenhouse gas emissions. Any new facility must be in alignment with the air quality SIP. Coal is unacceptable since it will produce harmful air pollution. If the old plant is any example, the new facility will be operating for at least thirty years-- if not longer. We need to transition beyond fossil fuels by then-- for both the sake of our national security, our health, and the stability of the climate system.

The Army should consider sourcing its energy needs from a diverse mix of local renewable and zero-carbon sources for several reasons:

- Fairbanks suffers from unacceptable and hazardous air quality, caused in part by the combustion of fossil fuels from the region's power plants, including Ft. Wainwright's current coal plant:
- Building additional fossil fuel generation—which will last decades—is incompatible with the Paris Climate Agreement and the overwhelming scientific consensus that anthropogenic carbon emissions must be rapidly decreased in order to keep global warming to at least 2 degrees Celsius
- Alaska has significant renewable sources—including base load geothermal heat and electricity, as well as wind and solar—that offer a diversified, reliable, inexpensive, and local energy supply.
- The military understands that climate change is a threat multiplier and has a duty to mitigate its own carbon emissions.
- A diversified mix of local renewable energy sources will enhance security and reduce midstream (transportation) vulnerabilities.
- The Army's Energy and Water Management Program stipulates (p. 242) the service should "Participating in research and development (R & D) efforts regarding new and improved energy and utility technologies", as well as implement "the Army Energy Strategy for Installations by—

(1) Eliminating/reducing energy waste in existing facilities.
(2) Increasing energy efficiency in new/renovated construction.

(3) Reducing dependence on fossil fuels.

(4) Conserving water resources.

(5) Improving energy security."

Thank you for your consideration--

Sincerely,
Philip Wight

--
Phil Wight (he/him), Fairbanks Renewable Energy Campaigner,

Fairbanks Climate Action Coalition

[redacted]

Caution-www.fairbanksclimateaction.org < Caution-http://www.fairbanksclimateaction.org/ >
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“This doesn’t get done by technology; this gets done by sheer human force of will.” --Jigar Shah

We recognize that we work throughout the unceded territories of the Indigenous Peoples of Alaska; that our office is located on the traditional territories of the lower Tanana Dene Athabascan Peoples. We acknowledge the ancestral & present land stewardship and place-based knowledge of the peoples of these territories.

To: Environmental Protection Agency (EPA)

From: Mike Craft, [redacted]

Date: August 20, 2019

I am making these comments to address the operation of a sixty year old coal plant that is currently running at 40% efficiency. As a tax payer, I am unwilling to subsidize such a blatant waste of money. I know that if operational capacity improvements were made the plant would run 60% cleaner than it currently operates. Please understand that the 40% rating is directly given at the power plant and does not include the poor performance of the utilidors and the heat distribution system. Some estimates hover around 20% efficiency overall. It would appear to me that a distributed energy scheme using either propane or LNG on a combined heat and power basis would solve all of the problems Ft Wainwright is experiencing and would be much cheaper, definitely cleaner, and would deliver resiliency.

I also know that Fairbanks, Alaska is dealing with (suffering) irreversible health damages with the PM 2.5 and source point pollution from coal being used at Ft. Wainwright. And the situation has prompted the EPA to assign interventions and rate Fairbanks as a serious non-attainment area. At a meeting at the Fairbanks North Star Borough on August 19, 2019, the Ft. Wainwright Deputy Commander informed the Alaska delegation that the US Army, Alaska had been asked by seventeen of its soldiers to be reassigned to avoid intolerable health effects for their families and spouses, relating to air pollution, specifically PM 2.5.

I would like to raise the issue of water pollution as it relates to coal ash disposal. I am not aware of an approved coal ash dump site for the Ft. Wainwright power plant. Is there a plan to address ash disposal and removal going forward?

Lastly, I want to understand the concept of Doyon Utility is not addressing EIS because Doyon Utility is the owner/operator as certified by the Regulatory Commission of Alaska. This is a statewide regulated utility with its own service area and for the last eleven years Doyon has operated with a CPC from the state of Alaska.

From: Scott Bell
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject: [Non-DoD Source] FW Powerplant EIS comment
Date: Wednesday, August 21, 2019 3:19:33 PM

Dear Ms. Sample,

I am submitting these comments regarding the EIS scoping for the Ft. Wainwright Power Plant.

A. It is imperative that the scoping take into consideration two significant issues.
1) Climate change and the infrastructure damage that is occurring in Alaska, as well as the identification of climate change as a national security issue.
2) Fort Wainwright is in the FNSB Non-Attainment Area and the new plant will affect the air quality in Fairbanks. There are significant health issues resulting from the poor air quality in Fairbanks, primarily a result burning wood and fossil fuels for heating, electricity and vehicle operations.
B. It is important to look beyond the scope of only replacing the existing plant. The first action should be to reduce the heating and electrical power demands served by the FWA power plant. Investing in infrastructure retrofits to reduce energy use will have a significant payback over the life of the FWA powerplant.
C. There should be a thorough investigation of maximizing the integration of renewable energy sources (including solar, wind, geothermal and hydro) and energy storage into the FWA power plant project. With the vast military budget, as well as the recognition by the military that climate change is a security issue which is already costing our community, state and nation vast sums to mitigate, the current cost of renewables should not be the determining or driving factor in the decisions about energy for Ft. Wainwright. Instead, factors such as the effects on climate and health should be higher priorities than first cost.
D. Estimate the impact of carbon fees which may be imposed during the life of the new power plant to estimate the financial impact of using coal, natural gas, and renewable energy sources, and as well estimating the benefits of demand reduction investments.
E. The health of military personnel should be considered and the expense of the treatment for the ailments caused by air pollution needs to be factored in as well. Ft. Wainwright personnel are currently, and will continue to be, impacted by the current air pollution in the Tanana basin.

Energy demand reductions and alternatives to fossil fuels are viable options in Alaska and we must as a society act quickly to counter the release of CO2 into the air. The military can lead the way in training personnel in renewables and demonstrating how clean energy can help power a military installation.

Sincerely,

Scott Bell
[redacted]

From:	Tanana-Yukon Historical Society
To:	USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject:	[Non-DoD Source] FWA Heat Electrical Upgrades
Date:	Wednesday, August 21, 2019 8:39:38 AM
Attachments:	unknown.jpg

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Laura Sample, NEPA Program Mgr

Thank you for the presentation on possible alternative solutions! Well done.

But, has geothermal energy, specifically as a complement to any or all of the proposed alternatives been considered?

Nearly a decade ago, one school in this area installed ground heat pumps to augment its fuel oil heating system and showed savings. A report of this project is found at Caution-http://www.cchrc.org/ < Caution-http://www.cchrc.org/ > Publications: Hybrid Ground Source Heat Pump at Weller Elementary School < Caution-http://www.cchrc.org/sites/default/files/docs/Hybrid%20GSHP%20at%20Weller%20Elemetary%20School.pdf >

Thank you for the opportunity to comment.

Elizabeth J Cook, Treasurer
Tanana-Yukon Historical Society

From:	Mike Musick
To:	Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Subject:	[Non-DoD Source] Fwd: EIS Scoping for the Fort Wainwright Power Plant.
Date:	Wednesday, August 21, 2019 12:18:42 PM

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Begin forwarded message:

From: Mike Musick [redacted]
Subject: EIS Scoping for the Fort Wainwright Power Plant.
Date: August 21, 2019 at 12:16:22 PM AKDT
To: laur.a.sample.civ@mail.mil < Caution-mailto:laur.a.sample.civ@mail.mil >

Laura Sample August 21, 2019
NEPA Program Manager
Director of Public Works Ft. WW

Dear Ms Sample,

Thank you for this opportunity to address the EIS for the Fort Wainwright Power Plant. I have several suggestions to offer but would like to first share a bit of my own history at Ladd Air Force Base in the mid 1950's. As a young teenaged dependent I had the opportunity to spend some time in the utilidors beneath the older part of Ladd Field going from the movie theater to the Officers' Club or the bus stop all inside the heated tunnels distributing combined heat and power to the base. I would suggest that going forward you should plan to run all utilities in accessible utilidors so that as technologies change or repairs need to be performed year round in comfort with out the expense of digging up roads or frozen ground.

My main concern for the new power plant is that it does not emit any green house gases including excess water vapor. To accomplish this I recommend that you consider the following suggestions:

1. Do not burn any fuel.

2. Consider the use of any or all the possible renewable energy sources in Alaska:

a. Wind

b. Solar

c. Hydro

d. Geothermal

All of these sources of heat and power will require back up and long term storage of heat and power. Natural gas and propane are considered to be the cleanest fossil fuels and may be good back up to intermittent renewable energy systems.

No matter what technology is incorporated, please keep in mind that Energy Efficiency is the first thing to implement. Second is Energy Conservation. These measures can be implemented now. Cutting energy use by up to 50% is possible and will require a much smaller power plant.

Air Quality in the Fairbanks area is often as bad as the air in Beijing, China. Please help us clean up the air in our community in the near term and to slow down climate change in the long run. You will also save a lot of money on energy bills forever.

Sincerely,

Mike Musick
Concerned Grandfather

From: Michelle Hollowell
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] IGU EIS Commentary - ATTN: IMFW-PWE (L.Sample)
Date: Wednesday, August 21, 2019 3:13:12 PM
Attachments: IGU EIS DOD Commentary Final.docx

Good Afternoon Ms. Sample,

Please find attached Interior Gas Utility's EIS Commentary. Please advise if any additional information is needed.

Respectfully,

Michelle Hollowell
Customer Service/ Conversion Manager
Interior Gas Utility/Fairbanks Natural Gas, LLC
[redacted]

The Interior Gas Utility (IGU) supports the conversion of coal-fired central heat to natural gas. IGU is well positioned to supply natural gas to either the centralized or the decentralized natural gas option. Natural gas consumption on Fort Wainwright, Alaska (FWA) would produce many benefits, to the base and the community. As a public utility, IGU is focused on lowering energy costs and improving the quality of life for all those who live here and visit here. We are focused on bringing economic and environmental relief to the residents of the Interior to keep our community vibrant and healthy. IGU is able to provide FWA with reliable and sustainable heating that complies with Army installation energy security requirements and air quality regulations for the Fairbanks North Star Borough.

Natural gas infrastructure requires less of a footprint than steam utilidors and is less intrusive to the surrounding land through simplified routing of gas piping. Natural gas requires less excavation and essentially has no impact to groundwater and surface water while coal requires significant water usage to remove impurities. The infrastructure from natural gas does not impact recreational resources of walk and bike paths, river access, etc.

The benefits of natural gas include areas such as land use, air quality, noise, geological and soil resources, water resources, socioeconomics, traffic and transportation, solid waste and hazardous materials, and human health and safety. "DOE analyses indicate that every 10,000 U.S. homes powered with natural gas instead of coal avoids the annual emissions of 1,900 tons of NO_x, 3,900 tons of SO_2, and 5,200 tons of particulates."(1)

Air quality in the Fairbanks North Star Borough is of high concern and natural gas is the cleanest burning fossil fuel. Natural gas releases 50% less CO_2 than coal. Natural gas also produces less SO_2, NO, and mercury compounds than coal. Coal leaves behind ash that needs to be disposed of, and natural gas equals no ash. The ash from coal has contributed to contamination of ground water in many states that now have to deal with contaminated water issues caused by leaching of toxic chemicals into the water tables. Ash disposal has additional regulations, procedures, safety concerns and costs.

The U.S. Energy Information Administration states – "Burning natural gas for energy results in fewer emissions of nearly all types of air pollutants and carbon dioxide (CO_2) than burning coal or petroleum products to produce an equal amount of energy.

Environmentally natural gas is the best choice for providing reliable, clean energy. Since natural gas provides a cleaner source for heat it means better health for the community on and off the base. The increased health benefits improve mission readiness. Natural gas will provide FWA with the ability to provide reliable heat that resolves current safety, resiliency, fiscal, and regulatory concerns.

[redacted]

[redacted]
interiorgas.com

From a financial perspective, IGU is the best solution. IGU is a municipally owned public utility and therefore is tax exempt. The tax exempt status provides a significant cost savings to FWA by eliminating the current tax repayment requirement for capital investment. The cost savings continues in regards to the health benefits of cleaner air, which equates to fewer medical bills and more productivity.

IGU is able to supply FWA with the needed energy security supply of natural gas to satisfy the mission ready critical components. The construction of our 5.25MM capacity tank will ensure our ability to meet the demand necessary for smooth operations and security of supply that meet the requirements of DOD. Our large storage tank is scheduled for completion Fall 2019. The tank provides a viable, reliable source of natural gas that gives IGU the ability to state that we can unequivocally provide FWA with natural gas.

In addition to our 5.25MM gallon capacity storage tank, we are expanding our Titan Alaska Liquefied Natural Gas (LNG) facility in Point Mackenzie. LNG is the method for provision of natural gas to the Fairbanks area. Natural gas is liquefied at the Titan Alaska LNG facility, supplied with gas from the Cook Inlet and transported in cryogenic vessels to the Interior. This method of delivery of natural gas to smaller markets has a long history and is a common solution to provide natural gas to markets not served by pipelines in the current energy market. (2) As part of this supply chain, IGU has expansion capabilities to meet the natural gas demands of Fort Wainwright while continuing to provide natural gas to Fairbanks area residents and businesses.

IGU has a contract with Braemar Technical Services to conduct the front-end engineering and design for the expansion (100,000gpd). The final investment decision for the 2 year construction expansion will be finalized by the end of 2019. After this initial planned expansion, the Titan plant will have the ability to further increase capacity by an additional 3 billion cubic feet (Bcf) per year to meet any future FWA demand. With the large storage tank and the Titan expansion, IGU will provide FWA with access to energy security that provides for a strengthened, ready and resilient base.

The need for LNG storage and regasification would be dependent upon the model of natural gas usage selected by FWA. IGU could also provide services for the buildout of a natural gas distribution system for the installation if desired. Ownership of the storage and/or distribution lines would be an option for FWA. Depending upon the selected mode of gas usage, nearby IGU transmission lines can be extended to provide service to the installation from the east. Additionally, development plans within the current IGU service area envision extension of service lines to the area immediately west of FWA; together, offering the installation a highly desirable redundant supply capability.

IGU has the support of the Fairbanks North Star Borough community leaders. IGU, through its wholly owned subsidiary, Fairbanks Natural Gas, has reliably provided natural gas to Fairbanks area residences and businesses for over 20 years. The management team has unrivaled experience managing the sourcing of gas as well as developing, building and operating the associated liquefaction, transportation, storage and ultimately distribution facilities in a safe, reliable manner.

IGU is qualified from a financial, technical, operational and management perspective to lead the effort to provide gas to Interior natural gas customers, including Fort Wainwright, and recommends the selection of natural gas as the option for Fort Wainwright. IGU is available to assist the DOD in any way necessary to develop and implement natural gas to provide heat and/or power to Fort Wainwright. IGU stands ready to economically, reliably, and safely meet the natural gas needs of Fort Wainwright.

(1) Proceedings of the National Academy of Sciences 109:6435-6440

(2) Alaska Journal of Commerce – LNG trucking expands as option in absence of pipelines 8/7/2019

[redacted]

[redacted]

interiorgas.com

FORT WAINWRIGHT
HEAT AND ELECTRICAL UPGRADES
ENVIRONMENTAL IMPACT STATEMENT

AUGUST 8, 2019 | CARLSON CENTER

COMMENT FORM

Please share your comments below.

Comments can also be emailed to:
usarmy.wainwright.id-pacific.mbx.heu-eis@mail.

Did the US Army consider a nuclear power option?

For example, NuScale Power partnered with Utah Associated Municipal Power Systems (UAMPS) to site a NuScale 12-module plant capable of generating 720MWe of electricity. NuScale and UAMPS will locate the plant within the 890-square mile site of the Department of Energy Idaho National Laboratory (INL-DOE).

NuScale Power announced on July 22, 2019 that the US Nuclear Regulatory Commission completed the second and third phases of review of NuScale's Small Modular Reactor (SMR) design.

According to the information presented at the public scoping meeting, the US Army considered four alternatives - new coal-fired CHPP, new dual-fuel combustion turbine generator CHPP, distributed natural gas boilers, and no action. All four options share common environmental impact traits: air emissions from the plants or boilers, air emissions from the equipment needed to produce and transport the fuels (e.g., coal, natural gas, diesel fuel).

NuScale's SMR would seem to offer a viable alternative for consideration.

COMMENTS ARE DUE BY AUGUST 21, 2019

Name: Malcolm Nason

Email: [redacted] **Phone:** [redacted]

Address: [redacted]

City: [redacted] **State:** [redacted] **Zip:** [redacted]

Requesting public review and comments on the scope of the Fort Wainwright Heat and Electrical Upgrades (HEU) Environmental Impact Statement (EIS) and environmental issues that should be studied is required in accordance with the National Environmental Policy Act. All written comments received during the scoping process will become part of the EIS administrative record and will be considered during preparation of the Draft EIS. Providing private email, address, and telephone information with your comment is voluntary and such personal information will be kept confidential unless release is required by a court or judge.

Response of Eco Green Generation LLC to Requests for Comment

On 84 FR 35106 Fort Wainwright Heat and Power

Dated: August 21, 2019

Issues to be discussed:

1. Does the Department of Army have jurisdiction to recommend a new facility for a combined heat and power upgrade at Fort Wainwright, Fairbanks, Alaska?
2. Under the National Environmental Policies Act, is the Department of Army authorized to issue an Environmental Impact Statement?
3. Has the Department of Army/Defense Logistics Agency sold the electric utility and steam heat utility at Fort Wainwright to Doyon Utilities LLC effective 2008?
4. Is the Department of Army a customer for electric and heat services by a regulated utility at Fort Wainwright? As such, can a customer determine facility upgrades?
5. Is Doyon Utilities a Regulated Public Utility under both State of Alaska and federal law?
6. Is federal law preempted by Department of Army contractual agreements?
7. Is Fort Wainwright and its air shed under a “serious nonattainment” designation by the US Environmental Protection Agency?
8. As a result of its determination of a serious nonattainment zone covering Fort Wainwright, the fort is under the requirement of “Best Available Control Technology” for stationary sources. Therefore is the US Department Environmental Protection Agency the federal agency required to produce an Environmental Impact Statement regarding any improvements or alterations by a regulated public utility for property in the serious nonattainment zone?
9. In EPA’s determination of “Best Available Control Technology” what is the least PM 2.5 polluting solution?
10. In EPA’s determination of “Best Available Control Technology” what is the least SO2 polluting solution?
11. In EPA’s determination of “Best Available Control Technology” what is the least NOx polluting solution?
12. In EPA’s determination of “Best Available Control Technology” what is the practical likelihood of available liquefied natural gas?
13. In EPA’s determination of “Best Available Control Technology” what is the largest incorporation of renewable non- polluting power?
14. If coal is considered, based upon future Clean Water Act litigation what is the plan to store new coal ash and what is the plan to remediate already stored coal ash?

Issue #1, Does the Department of Army have jurisdiction to determine new electric and heat facilities at Fort Wainwright?

Discussion: Normally the Department of Army will have jurisdiction to make any needed improvements at any US Army base. However, under a privatization agreement in 2008, the Department of the Army sold its interest for a period of 50 years to Doyon Utilities to own and provide electric and heat services to Fort Wainwright. That leaves the following question, "Is the Department of the Army in regard to electricity and heat services an owner, a regulated public utility or a mere customer?" Review of the privatization contract will recognize a sale. Under Alaska state law, any third party selling electricity must receive a certificate of public convenience and become a regulated public utility. There is no record of the Department of Army receiving such certificate. Therefore, by the process of elimination, the Department of Army is a mere customer.

As a mere customer, the Department of the Army is not granted initial party status with the Regulatory Commission of Alaska, which has original jurisdiction over the approval of utilitys' new electrical and steam heat generation facilities or the sale thereof. Such RCA jurisdiction reviews tariff requests by the utilities it regulates, in this case Doyon Utilities LLC. Any comments by the Department of the Army are subject to a grant of impleader status by the RCA.

Issue #2, Under the National Environmental Policies Act, a federal agency which has jurisdiction must produce an environmental impact statement for the replacement of an existing power plant on a military base. If the Department of Army, by virtue of its previous sale of the electric utility at Fort Wainwright no longer has jurisdiction, then, unquestionably, because of its prior determination of a serious nonattainment air pollution zone covering Fort Wainwright, the US EPA has jurisdiction over stationary sources of pollution and is statutorily required to issue the final EIS. As such, the US EPA is required to provide proper notice of an EIS in the Federal Register.

Issue #3, Under the terms of a contract effective in 2008, the Department of the Army/Defense Logistics Agency sold the production, transmission and distribution of electricity and steam at Fort Wainwright to Doyon Utilities LLC. The Department of the Army retained the right to purchase the coal for the power and steam plant. At a public hearing on Monday, August 19, 2019 to the Fairbanks North Star borough assembly, Senator Sullivan and Senator Murkowski together with the director of the US Environmental Protection Agency, Doyon Utilities LLC represented that it owned and operated the power and steam plant at Fort Wainwright and it owned the transmission and distribution system for both the electricity and steam at the fort. The term of the utility sale contract is 50 years, (2058).

Issue #4, Under the terms of Federal Power Act of 1935, a customer of electric services does not have either standing or authority to determine the type or size of a power production facility proposed by a regulated public utility. Under the controlling laws of the State of Alaska, Doyon Utilities LLC is a regulated public utility and the regulatory body with initial jurisdiction is the Regulatory Commission of Alaska. There is no case or statutory law granting an electricity customer the right to determine the type or size of the facilities of a supplying regulated utility.

Issue #5, In 2007, Doyon Utilities LLC applied for and received a certificate of public convenience from the Regulatory Commission of Alaska. Therefore, since beginning operations in 2008, Doyon

Utilities LLC has been a regulated public utility operating an electric and steam heat utility on a geographically reserved service area that encompasses Fort Wainwright. Perhaps the Department of the Army is relying on some provision in its contract for the sale of the electric utility to repurchase the utility and now reassert jurisdiction. If so, the Regulatory Commission of Alaska will have to first approve of the resale. Such approval is far from a sure event because the RCA is entrusted with protecting the public, therefore the pollution history of the coal plant and the Army's efforts or lack of effort to address the serious health hazards caused from its emitting of PM 2.5, NOx, SO2 and coal dust is subject to review. As such, public hearings on the issue will likely be raised by the environmental community of Fairbanks.

Issue #6, In the event there is a conflict between federal or state law and a contractual provision contained in the 2008 privatization agreement both state and federal law preempt the conflicting operation of contractual provisions. Thus any buyback provision may be voided by the RCA.

Issue #7, On April 28, 2017 the EPA designated much of Fairbanks North Star Borough, and specifically Fort Wainwright as a serious nonattainment zone for 24 hour PM 2.5 fine particulate matter per the National Ambient Air Quality Standard. As a result, the Clean Air Act of 1963 requires the implementation of Best Available Control Technology for all stationary sources of industrial air pollution within the serious nonattainment zone.

Issue #8, Under the terms of BACT the EPA will examine PM 2.5 emissions. Because of coal plant's lower heat rate (less efficient combustion) they emit a much higher amount of PM 2.5 when compared with natural gas and propane. Currently according to its Air Permit with ADEC, Fort Wainwright produces 124.3 tons per year of PM 2.5 pollutants. Wind generation of power produces no PM 2.5 pollution. Therefore, as to PM 2.5 only natural gas and propane in conjunction with wind can be BACT and will result in the elimination of nearly all of the PM 2.5.

Issue #9, At a Fairbanks North Star Borough assembly meeting on August 19, 2019 the University of Alaska Fairbanks reported that the coal they purchased locally for their coal plant had a higher degree of sulfur than they anticipated. Currently the Fort Wainwright coal plant produces 1,767 tons per year of SO2. Sulfur content in diesel and natural gas cannot be economically reduced whereas propane can achieve zero content.. Therefore as to SO2 content, only propane is BACT.

Issue #10, Currently the coal plant produces 1,533 tons of NOx per year. With the use of the most efficient selective catalytic reduction units both propane and natural gas can eliminate 99% of NOx and that figure will be the BACT standard.

Issue #11, The supply of liquefied natural gas in Fairbanks is suspect as the existing liquefaction plant is limited in its capacity and likely will have OSHA problems as it lacks original engineered site plans to insure proper maintenance and repair. The cost, per MMBtu is estimated by a board member of the Interior Gas Utility at more than $24 MMBtu which exceeds the cost of propane, coal and low sulfur diesel.

Issue #12, Eco Green Generation will submit a plan incorporate up to 8.4 MW of wind generation and 20 MW combined heat and power plant fueled with propane and ultra low sulfur diesel pilot fuel (3%) to provide a nearly pollution free source of power to Fort Wainwright. This nearly pollution free energy should be a BACT consideration especially in light of factoring in health care costs of pollutants to Fairbanks residents of the various PM 2.5, SOx, NOx, and coal ash disposal hazards

Issue #13, Downstream of Fort Wainwright ground water has been polluted by coal ash. Increased levels of arsenic and mercury are present emanating from unlined coal ash deposits. The addition of more coal ash that may become aerosoled will only exacerbate the damages to Fairbanks residents ' health and should disfavor a BACT finding.

Conclusion, The Department of Army should be aware that Eco Green Generation will offer Doyon Utilities LLC. a wholesale electricity and heat contract from 4 distributed generation facilities on Fort Wainwright together with wind generated electricity from a wind farm which is 90 miles away in Delta Junction connected by a high voltage line provided by Golden Valley Electric Association. The contract will seek a term of 25 years, will not require any capital investment by the Army and will charge wholesale electric rates no more than the cost avoided rate Doyon Utilities LL would have incurred if it built a BACT compliant power and heat plant.

Respectfully submitted, this the 21st day of August, 2019

William Rhodes, manager, Eco Green Generation LLC

August 20, 2019

Laura Sample, NEPA Program Manager via email: laura.a.sample.civ@mail.mil
Directorate of Public Works
ATTN: IMFW-PWE (L. Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

Dear Ms. Sample:

Thank you for the opportunity to provide 'scoping comments' on replacing the coal-fired central heat and power plant (CHPP) on Fort Wainwright in Alaska.

First, we simply cannot afford to continue with the old model of burning coal to generate heat and electricity. The local air shed is already too polluted, and the planet is experiencing a climate crises from the combustion of carbon-rich fuels. Please develop a suite of alternatives that are carbon-neutral for meeting the operational needs of Fort Wainwright. Adopting super-efficient end-uses for power, such as LED lighting and super-insulated buildings will minimize the scale and amount of energy needed to meet the needs of a modern Fort Wainwright. The local Cold Climate Housing Research Center and the national Rocky Mountain Institute are providing tools for successfully moving us away from coal.

In addition to efficiencies, alternatives to coal (or carbon) to develop in the draft E.I.S. include:

1) Geothermal – through a deep borehole 1500 to 4000 feet deep on-site
    a. Chena Hot Springs Resort and Iceland are great examples
2) Solar technologies, including photovoltaic and wind generators
3) Ground loop circulators with heat exchangers
4) Biomass such as wood-chips or pelletized local wood products
5) On-site battery storage for back-up
6) Purchase of off-site generated wind, hydroelectric, or other solar sources
7) Or a combination of the above that fully replaces the need for burning of coal, fuel oil, or gas

I request an extension of at least thirty days to this scoping period to provide for more meaningful input on this major replacement project. My request is due to the Fairbanks North Star Borough being within a PM 2.5 'Non-Attainment Area' because of unhealthy particulate air pollution, as well as the planet itself reeling from unprecedented climate change driven by anthropogenic sources of carbon dioxide being pumped into the atmosphere from fossil fuel sources. The original thirty-day scoping period is much too short and totally inadequate to get the word out in the summer and for citizens to provide input into this process that potentially threatens to exacerbate local air pollution and contribute to global climate change emergency. The era of coal-fired power plants has ended; more time is needed to better define alternatives that are consistent with and support our security, our society, and our world.

Sincerely,

James Schwarber

James Schwarber
[redacted]

From: Stefan Milkowski
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] scoping for Fort Wainwright heat and electrical upgrades EIS
Date: Tuesday, August 20, 2019 11:31:00 AM

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Dear Ms. Sample,

Thank you for the opportunity to comment, and for hosting the open house in Fairbanks. I came away impressed by the scope of the project and the range of considerations involved.

I believe the contribution to greenhouse gas emissions should be one of the top considerations. I recognize climate change is a global problem that will require collective political action, and that any individual decision doesn't matter much. But I believe strongly that projects like this should strive to be consistent with the future we know we need and should not stand in the way of the kinds of global action we need, such as a price on carbon.

Specifically, I would request that the EIS include:

-a scientifically rigorous accounting of greenhouse gas emissions of each alternative, including but not limited to embodied energy of new infrastructure and carbon costs of construction (including concrete), and combined efficiency of different production and distribution types. This analysis should consider the carbon impacts on a life-cycle basis, including the impact of decommissioning.

-an analysis of the option of addressing heating and electrical needs through efficiency measures (reducing demand) rather than new or increased generation. If it is cheaper to reduce demand than to produce the heat or power, then that should be done.

-an analysis of each proposal's consistency with new or newly economic, less polluting options. Electrical production, battery storage, and the use of electricity in transportation and for heating through heat pumps are all fast-changing fields. The ability of a given plan to take advantage of these new and newly cheap technologies is a consideration that should be studied and valued in ranking. Projects should also be considered in light of future legislation or regulation to reduce greenhouse gas emissions, which is a potential economic liability for all energy infrastructure.

Thank you again for allowing the opportunity to comment. I look forward to reviewing the EIS.

Thank you,
Stefan Milkowski

--

Stefan Milkowski
[redacted]
Caution-www.citizensclimatelobby.org/carbon-fee-and-dividend < Caution-http://www.citizensclimatelobby.org/carbon-fee-and-dividend >

From: Dave Nebert
To: USARMY Ft Wainwright ID-Pacific Mailbox HEU EIS
Subject: [Non-DoD Source] The future of Wainwright power
Date: Monday, August 19, 2019 5:44:32 PM

Fort Wainwright planners.

It's unfortunate that our local IGU failed to take the **Siemens** offer to bring natural gas into the Fairbanks area for less than what they are attempting. Siemens also had plans to get natural gas to Ft Wainwright and possibly to Eielson AFB as well. If at all possible, the Army should try to build a natural gas power plant as opposed to staying with a coal driven system.

Good luck, Dave Nebert, Fairbanks resident

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[redacted]

www.usibelli.com

August 21, 2019

Laura Sample, NEPA Program Manager
Directorate of Public Works
ATTN: IMFFW-PWE (L. Sample)
1046 Marks Road #6000
Fort Wainwright, AK 99703-6000

RE: Comments for Fort Wainwright Heat and Electrical Upgrades Environmental Impact Statement Scoping

Dear Ms. Sample:

Thank you for the opportunity to submit comments during public scoping under the National Environmental Policy Act (NEPA) in preparation of an Environmental Impact Statement (EIS) addressing heat and electrical generation and distribution upgrades at Fort Wainwright, Alaska (FWA).

The Notice of Intent (NOI) published in the Federal Register on July 22, 2019 stated that the coal-fired central heat and power plant (CHPP) at Fort Wainwright requires an upgrade and that the purpose of the Proposed Action is to provide reliable heat and electrical infrastructure for the installation that resolves safety, resiliency, fiscal, and regulatory concerns.

The Statement of Need identified five areas:

1. Reduce the overall utility cost by having a system that runs more efficiently.
2. Minimize the risk of a single point of catastrophic failure that may require evacuating the installation and may severely affect mission readiness.
3. Meet mandated energy efficiency requirements.
4. Be compliant with emissions standards.
5. Conform to energy security criteria detailed in Army Directive 2017-07.

Current Alternatives Being Considered in the EIS:

1) Build a new CHPP – new, modern, coal-fired CHPP and steam distribution system.
2) Build New Dual-Fuel Combustion Turbine Generator CHPP - (replacement with natural gas and/or ultra-low sulfur diesel) combustion turbine generator CHPP with steam distribution.
3) Install Distributed Natural Gas Boilers – this action would transition from a centralized heat and power model to a decentralized model. The garrison

would install multiple high-efficiency natural gas-fired boilers that would be dispersed at facilities across the installation to provide heat, and purchase all required electricity from the regional electrical grid.

4) No Action – continued use of the existing heat and electrical infrastructure without constructing any new facilities.

Recommended Preferred Alternative

Building a new, modern, coal-fired CHPP and steam distribution system should be the preferred alternative as it is the only option that can provide a safe, resilient heat and power system to the garrison at a price that will be much less than any other alternative.

Coal provides fuel resiliency; it has been a proven fuel source for over 75 years. There are over 700 years of proven reserves at Usibelli Coal Mine, Inc. (Usibelli), in Healy, Alaska, just a short 114 miles from FWA. Furthermore, Usibelli has a proven supply chain which has provided heat and power to the region since 1943. This supply chain has proven to be financially self-sufficient, not requiring government subsidies as compared to the Liquefied Natural Gas (LNG) option which has been heavily reliant upon multiple forms of subsidies. As mandated by Army Directive 2017-07 (Installation Energy and Water Security Policy), Usibelli can provide assured access to the coal resource supply. The installation currently maintains between three to six months coal supply on post.

The installation must maintain critical mission capabilities and mitigate risks posed by energy and water interruptions. A coal-fired CHPP has been proven to provide available, reliable, quality power and water which continuously sustain critical missions.

The new, modern, coal-fired CHPP option will provide the lowest present value cost due to the low cost of coal. The coal-fired CHPP will continue to support the use of the utilidor system by providing heat to prevent the domestic water and waste water pipes from freezing.

Coal has the lowest price per million British thermal unit (MMBtu) out of any alternative fuel source being considered. Burning diesel or trucked natural gas costs nearly 3 to 5 times the cost of coal. Coal is locally available, has the lowest cost, and can maintain a large storage capacity. Military spending supports about one-third of the Fairbanks economy. Any large increases in energy costs could potentially risk the sustainability of the military's current presence in the Interior and stability of the Fairbanks economy.

The emission profile of coal is also favorable. Today's new, modern coal plants burn just as cleanly as natural gas plants, and a new coal-fired CHPP at FWA will greatly improve efficiency and emission rates. A new CHPP at FWA would be required to install Lowest Achievable Emission Rate technology; this plant could arguably have the lowest emission rate for any power plant in Interior Alaska.

Inaccuracies in the Notice of Intent
The NOI included incorrect statements which must be corrected. The NOI stated that the current system is "failing to meet air emissions standards" – this is incorrect. This falsehood creates misunderstanding about the current condition of the plant causing people to believe that it is out of compliance and leading to a conclusion that steps must be taken to come into compliance. The power plant is in fact, in compliance with emission standards. Additionally, the NOI claimed that the power plant has had "near-critical failures." The EIS should clarify and explain this statement.

Deficiencies in the Statement of Need
The statement of need lacks specific measurable metrics to demonstrate how each alternative meets the criteria identified.

The need statement to "Reduce the overall costs by having a system that runs more efficiently" should specify the energy efficiency requirement and have measurable metrics for efficiency and for costs. One alternative may be more efficient than another alternative but would cost more due to fuel prices, operation and maintenance costs, or other factors. Cost criteria should be clearly defined if it is life-cycle cost or just operational costs.

The need statement "minimize the risks of a single point of catastrophic failure that may require evacuating the installation and may severely affect mission readiness" should look at single points of failure not just within the fence line but also for the fuel or power source supply chain. This criterion should specify if it applies to the entire installation or just the mission critical facilities. Is the single point of failure criteria to apply to power as well as the heat supply?

The need statement "meet mandated energy efficiency requirements" should identify if the requirement is based on energy conversion regardless of cost, or if cost efficiency is the measurable metric.

The need statement "compliant with emission standards" should identify the exact promulgated regulations that currently apply to each alternative and not proposed rules that are unpredictable.

Centralized System: New Dual-Fuel Combustion Turbine Generator CHPP
Any centralized system would presumably use the existing utilidor system. The Frequently Asked Questions state that the current utilidor system is at the end of its design life. At the public scoping meeting one of the project designers stated that the condition of the utilidor system needed to be evaluated but that there have been many projects upgrading the system. A comprehensive evaluation of the condition

of the utilidor and any system improvements should be included in the EIS development and be part of the life cycle cost analysis.

According to one of the project designers, FWA currently has back-up power supply from Golden Valley Electric Association (GVEA), therefore a back-up power supply will not be an additional cost to the centralized alternatives only to the decentralized alternative. Will the centralized alternatives require back-up heat to all facilities?

Decentralized System: Distributed Natural Gas Boilers
The decentralized alternative would require a 20 Megawatt (MW) power plant to provide back-up heat to the installation. Will the reliability of maintaining a standby 20 MW power plant and applicable life cycle costs be factored into the analysis and included in the EIS?

The decentralized alternative would require extensive new construction within a Historical Landmark. All mitigation requirements and cost should be factored into the analysis.

The decentralized alternative would require extensive excavation with the Comprehensive Environmental Response, Compensation, and Liability Act, National Priorities List (CERCLA, NPL) site. The cost to excavate and remediate the contaminated soils should be factored into the analysis.

The decentralized system would require either adding a heat source back to the utilidor distribution system or adding heat trace and circulating systems to the water and sewer systems. All of these changes to the utilities and their associated power costs should be factored into the analysis.

The EIS should model all emissions for each alternative. Typically, models have shown that centralized power plants do not contribute to PM 2.5 pollution but the proposed numerous decentralized fuel oil boilers would contribute to the PM 2.5 concentrations. This is a serious issue given the fact that FWA is within a Serious Non-Attainment area.

The EIS should model the impact of ice fog and the applicable regulations. It is well known that natural gas emissions have a high level of water content. This becomes an issue when the discharge of those emissions are closer to ground level as compared to a taller stack at a central power plant.

According to reports made by Interior Gas Utility (IGU), LNG pricing is subject to IGU being able to supply enough gas in its distribution channels to keep its prices low. Analysis of the upstream pricing mechanism for natural gas should be included in the EIS. IGU is incapable of guaranteeing price stability to FWA. Currently, there is only one company producing gas in Cook Inlet. IGU purchases its gas from this sole provider. Recent reports have shown that the cost of gas from Cook Inlet is more than 3 times the cost of gas in the contiguous lower 48 states. Alternatively, coal prices have only increased an average of 3.9 percent each year over the past 30 years. The EIS should provide a thorough analysis of price volatility for all fuel sources being considered.

Resiliency

Most of the alternatives presented rely on natural gas or diesel as the fuel source. In addition to the efficiency and cost of fuel sources, the EIS must analyze and address reliability and availability of fuel sources. Natural gas, in the volume required to meet the needs at FWA, is not currently available in Interior Alaska. At present, the natural gas supply system relies on trucking gas from Point MacKenzie which has a single point of failure if something were to happen to the Parks Highway.

An analysis of locally sourced fuel oil availability should be included in the analysis due to the increased demand for jet fuel and the limited refining capability in Alaska. If the fuel oil has to be shipped from the lower 48 states then the reliability, cost, and availability should be considered in the analysis.

FWA currently uses approximately 250,000 tons of coal per year which is equivalent to 3.75 billion cubic feet (BCF) of natural gas based on energy content. Army Directive 2017-07 requires a minimum of 14-days of energy security. A 14-day supply of LNG based on current energy use will require about 1.7 million gallons of storage capacity. Because Fairbanks has the potential of being isolated from the supply chain, a larger reserve than a minimum 14-day supply makes tactical sense. Currently, FWA keeps at least a 90-day supply of coal. The equivalent LNG storage would have to be 11.1 million gallons, and diesel storage would be approximately 6.6 million gallons. The EIS should also consider the impact of a single point of failure on large concentrated storage.

Since resiliency is a critical part of the statement of need for FWA's future energy system, the reliability of the regional electrical grid must also be evaluated.

Positive Environmental Benefits of Coal Ash

Within the Resource Conservation and Recovery Act regarding coal ash disposal, the ability to use coal ash as beneficial fill should be a significant consideration. The use of coal ash is allowed for roadway projects in both federal and state regulations for solid waste and provisions for use as structural fill are also available. Additionally, if carbon content in the coal ash is low, the ash could qualify for use in Portland cement mix. Beneficial reuse of coal ash is a positive impact and could provide a measurable recycling credit to the installation's activities.

Other Alternatives

The NOI states that "Other reasonable alternatives raised during the scoping process and capable of meeting the project purpose and need will be considered for evaluation in the EIS." An alternative to retrofit the existing power plant to meet all of the identified needs should be considered as part of the EIS analysis. This option would allow for a reduced capital cost while still providing for increased efficiencies and lower emissions. Much of the supporting plant infrastructure such as material handling systems, the building envelope, and cooling system, could be reused. FWA would realize substantial upfront capital savings.

Additionally, the EIS should consider other coal-plant options such as Integrated Gasification Combined Cycle, gasification with internal combustion engines and boilers, multi-fuel options (including coal, biomass, diesel and natural gas), stoker boilers, circulating fluidized bed technology, as well as pulverized coal boilers.

Conclusion

Within the current portfolio of energy sources that FWA can choose from, the difference in cost (infrastructure, operation, fuel, and transportation) is dramatic. A new coal-fired CHPP will substantially reduce the cost of energy for FWA, while increasing efficiency, reducing emissions, continue to provide an affordable, safe, and resilient supply of heat and power to Fort Wainwright, Alaska.

Usibelli Coal Mine looks forward to continuing to participate in the EIS process. Should you need additional information, or have questions, please do not hesitate to contact Lorali Simon, Vice President of External Affairs [redacted]

Sincerely,

Joseph E. Usibelli Jr.
President
Usibelli Coal Mine, Inc.

From: Patrice Lee
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
Cc: patricelee3294@gmail.com
Subject: [Non-DoD Source] USA-2019-HQ-0001-Comments for EIS-Fort Wainwright
Date: Wednesday, August 21, 2019 8:48:05 PM

Dear Ms. Sample.
I neglected in my first e-mail to include pertinent, potentially required information.

Comments by:
Patrice R. Lee
[redacted]

Comments are submitted on behalf of myself and my family.

To: The Department of Defense, via Ms. Laura Sample

Fort Wainwright is an integral part of the Fairbanks North Star Borough and is valued for the community of fine people who work and live there, those who contribute to, diversify, protect, raise their families, and recreate in our fine city. At this time Fort Wainwright's aging, undependable, inefficient heat and power plant must be replaced. The Fairbanks North Star Borough is in a "Serious Non-Attainment" status with the EPA for air quality with the highest wintertime levels of PM 2.5 in the United States. Our community is fighting to reduce air pollution as well as other types of pollution and every move forward must be one that involves cleaner energy sources, and more efficient technologies. It is estimated that the Fort Wainwright plant is extremely inefficient. It may be running as low as 40% efficiency and that is not economic. The taxpayer money is 60% wasted if efficiency is 40%. That is not sustainable, not a best practice, and a needless waste. Coal is dirty, inefficient, outdated, and cannot help our community meet attainment and compliance with the Clean Air Act. Coal ash is overwhelming parts of the community, contaminating large areas and regulatory based safety precautions are not in place to deal with coal ash. Moving forward, the community will be best served if coal, as a solid fuel, is eliminated from the heat and power production at Fort Wainwright. We need to reduce air pollution right now for the health of everyone living in the borough. The military must not constrained in their mission because we are beyond maximum pollution limits. Build a new, efficient, technologically sound power plant that uses natural gas/propane. Combined heat and power is a good technology to consider. Make the plant as flexible as possible to employ/mix renewable energy sources such and wind, solar, and geothermal. Our community needs an Energy Policy so we can come into concert with opportunities to build new, efficient heat and power infrastructures. We're not there yet, but if we were, I'm quite sure that moving to natural gas/propane as a cleaner, more efficient fuel would not only improve many aspects of life in Fairbanks, it would help anchor best practices as we move forward.

From: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA)
To: Lisa Baraff
Cc: Sattler, Alan G (Grant) CIV USARMY USAG (USA)
Subject: RE: [Non-DoD Source] FWW CHPP Army-Doyon contract clause question (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Lisa,

Thank you for your question, however we cannot provide a future valuation on a hypothetical regarding the Doyon Utilities Contract to the public. We are looking forward to addressing the comments you have prepared for the proposed action.

Regards,
Laura

Laura A. Sample
NEPA Program Manager
DPW Environmental Division
USAG Alaska
Desk: (907) 361-6323
Fax: (907) 361-9867
Email: laura.a.sample.civ@mail.mil

We are the Army's Home
Learn more at www.wainwright.army.mil

-----Original Message-----
From: Lisa Baraff [redacted]
Sent: Wednesday, August 21, 2019 11:50 AM
To: Sample, Laura A CIV USARMY IMCOM PACIFIC (USA) <laura.a.sample.civ@mail.mil>
Subject: [Non-DoD Source] FWW CHPP Army-Doyon contract clause question

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Hi Laura,

I spoke with Tracy Carter on Monday about the contractual relationship with Doyon Utilities, who owns and operates the FWW power plant. During that conversation, she mentioned that if/when the plant is no longer in use, DoD can purchase it from Doyon for $1. Can you verify this?

Thanks!

Best,

Lisa

--

Lisa Baraff

(she/her/hers)

Program Director

<Caution-https://drive.google.com/uc?id=0B2ILBeUeoDGxbFE2YTM4Qm9aOXc&export=download>

Northern Alaska Environmental Center

[redacted] > Caution-www.northern.org <
Caution-http://www.northern.org/ >

<Caution-https://docs.google.com/uc?export=download&id=0B2ILBeUeoDGxUDJScUFjNVRDaFU&revid=0B2ILBeUeoDGxTFpQZHI1eURoaHlLY1JkZERZZEVBQ2RNRmpVPQ>
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CLASSIFICATION: UNCLASSIFIED

DOYON Limited®

February 28, 2020

The Honorable Ryan D. McCarthy
Secretary of the Army
[redacted]

Dear Secretary McCarthy:

Doyon, Limited (Doyon), an Alaska Native Corporation (ANC) established pursuant to the Alaska Native Claims Settlement Act of 1971 (ANCSA), requests that the United States Army engage in Consultation in connection with the Army's upcoming decision to upgrade the heat and electrical generation and distribution systems at Fort Wainwright. Doyon is requesting consultation as the Army's decision has the potential to significantly affect Doyon and its over 20,000 Alaska Native shareholders.

As the Alaska Native Regional Corporation for Interior Alaska, Doyon's mission includes enhancing our position as a financially strong Native corporation, promoting the economic and social well-being of our current and future shareholders, strengthening our shareholder's Native way of life, and protecting our lands and resources. To satisfy our mission and shareholder obligations, Doyon owns and operates over a dozen for-profit companies. Among its companies, Doyon holds a 50% ownership interest in Doyon Utilities LLC, which in 2007, was awarded a 50-year utility privatization contract that transferred to Doyon Utilities ownership of the Fort Wainwright Central Heat and Power Plant (CHPP), a coal-fired cogeneration facility consisting of six boilers and four steam turbines that supplies the installation's heat and electricity.

On July 22, 2019, the Army announced its intent to prepare an Environmental Impact Statement (EIS) to address heat and electrical generation and distribution upgrades at Fort Wainwright.[1] The three action alternatives that the Army will consider in the EIS include: (1) constructing a new coal-fired CHPP, (2) constructing a new dual-fuel combustion turbine generator CHPP that would be primarily fueled by natural gas, and (3) decentralizing heat and power, with heat provided by distributed natural gas boilers installed at individual facilities and electricity purchased from the regional electrical grid.

While the Army's EIS materials to date are silent on the future of the existing CHPP, each of the alternatives, and likely any other alternatives that the Army identifies and evaluates in the EIS, has the potential to significantly affect the continued operation of the existing CHPP at Fort Wainwright. Any alternative that shuts down or significantly diminishes the generation of Doyon

[1] 84 FR 35106 (July 22, 2019).

Utilities' CHPP will substantially reduce or eliminate revenues that benefit Doyon and its shareholders. Even further, such a decision would have the unprecedented consequence of devaluing and risking the loss of one of the largest utility privatization contracts that DoD has ever awarded, which Doyon competed for, negotiated, was awarded, and pursuant to which, Doyon subsequently invested a significant amount of money in utility infrastructure modernization. The Army's proposal unquestionably puts that contract, which has 38 years remaining, as well as, Doyon's significant investment of money and resources to date, at great risk.

In these circumstances, Consultation is critical for the Army to fully understand and properly consider the potential impacts of its decision on Doyon and its shareholders. The Department of Defense's (DoD) Consultation Policy[2] requires the Army to engage in consultation on "a timely and good faith manner with Alaska Native corporations on any proposed action or policy that may have a substantial direct effect . . . on the ability of an Alaska Native corporation to participate in a DoD or DoD Component program for which it may otherwise be eligible," including, specifically, on "proposed actions, plans, or ongoing activities that may have the potential to significantly affect . . . business contracting matters."[3]

To comply with the letter and spirit of the Consultation Policy, this required consultation must occur "early in the planning process,"[4] which here, means before the Army issues its Draft EIS (DEIS). Pursuant to NEPA, the DEIS will address a wide range of impacts, including on socioeconomics and existing utilities,[5] which are resource areas that uniquely affect Doyon and its shareholders. It is therefore critical both for ensuring an adequate and legally sufficient EIS and for meeting its obligation to engage in "meaningful consultation,"[6] that the DEIS consider and address Doyon's interests and concerns when it identifies and analyzes alternatives and impacts associated with its potential action at Fort Wainwright. Indeed, given the potential impacts on Doyon, one of the first items that Doyon and the Army should address in consultation is whether Doyon should be a cooperating agency in the Army's EIS.[7]

Doyon understands that the Army intends to issue its DEIS by July 2020, making it imperative that Doyon and the Army engage in consultation as soon as possible. Further, given the unique circumstances and what is at stake here, including the possible shut-down of an ANC-owned and operated utility, a pending decision that could affect one of the largest utility privatization contracts DoD has ever issued, a fast approaching DEIS publication date, and, most importantly, a decision that could have significant repercussions on an ANC and its more than

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[2] *See DoD Instruction 4710.02: DoD Interactions with Federally-Recognized Tribes* (Sept. 24, 2018), which establishes DoD's policy for interacting and working with federally-recognized American Indian and Alaska Native governments. Federal agencies must consult with Alaska Native corporations on the same basis as Indian tribes under Executive Order No. 13175.
[3] *DoD Instruction 4710.02,* at secs. 3.1(c) and 3.2(a)(10).
[4] *I*d. at sec. 3.3(a).
[5] U.S. Army Garrison (USAG) Alaska, Frequently Asked Questions (can be accessed at https://home.army.mil/alaska/application/files/8315/6389/7616/20190722_HEGDU_EIS__FAQs_Final.pdf
[6] Achieving "meaningful consultation . . . demands that the information obtained from tribes be given particular . . . consideration, [which] can happen only if tribal input is solicited early enough in the planning process that it may actually influence the decision to be made."
[7] *See CEQ Memorandum for Heads of Federal Agencies: Designation of Non-Federal Agencies to be Cooperating Agencies in Implementing the Procedural Requirements of NEPA* (July 28, 1999).

20,000 shareholders, Doyon believes that it is critical that the initial consultation meeting include both the Fort Wainwright Installation Commander and the Secretary of the Army.

Doyon looks forward to engaging in consultation with the U.S. Army on this very important matter.

Respectfully submitted,

Aaron M. Schutt

Doyon, Limited, President and CEO

CC:
The Honorable Alex A. Beehler
Assistant Secretary of the Army for Installations,
Energy and Environment (ASAIE)
[redacted]

Colonel Christopher J. Ruga
USAG Alaska Garrison Commander
[redacted]

May 15, 2020

Colonel Christopher J. Ruga
Office of the Garrison Commander
[redacted]

Dear Colonel Ruga:

Thank you for facilitating a consultation meeting on May 7, 2020, to discuss the long-term heat and power needs at Fort Wainwright, and the Army's decision-making process and ongoing NEPA action to consider replacement of the Fort Wainwright Combined Heat and Power Plant (CHPP). I found the session productive and I appreciate your willingness and commitment to continue a dialogue to ensure that the US Army understands Doyon, Limited's unique role as an Alaskan Native Corporation and equity holder in Doyon Utilities, and the significant implications that the Army's decision could have on Doyon, its shareholders, and the Army's Utility Privatization (UP) contract, as well as the entire Fairbanks region. At the same time, I believe that our discussion confirmed the unique opportunities that exist for the Army and Doyon Utilities to continue our successful partnership in ensuring that Fort Wainwright receives reliable utility services.

As the Army moves forward with its NEPA process, and we continue our discussions and consultation, I wanted to reiterate and confirm our understanding of our May 7th discussion.

- First, terminating the CHPP portion of the UP contract 38 years early or taking on a different UP provider would have a significant impact on Doyon's 20,000 shareholders. Doyon Utilities has invested significantly to improve and sustain the plant, and reasonably relies on the revenues from the UP contract, which are critical in supporting Doyon, Limited's mission and shareholder obligations.
- Second, whatever alternative is chosen, it is critical that the CHPP is adequately maintained in the interim and during any transition period. While Doyon Utilities strongly believes that the CHPP is in far better shape than portrayed in the Federal Register Notice of Intent, some sustainment activities will be required to ensure the continued safe and reliable operation of the CHPP. Doyon Utilities is committed to working with the Army to limit sustainment activities and capital costs to only what is necessary, including strongly advocating (as the air emissions permittee) to the Alaska Department of Environmental Conservation to limit any required emissions control equipment if the Army decides to decommission the CHPP.
- Third, Doyon Utilities wishes to (and equitably should) continue as the owner and provider of utility services at Fort Wainwright. Doyon Utilities competed fairly for

and was awarded the UP contract, and since that time has built a leadership and operations team that will be best suited to sustain the CHPP and transition to the next form of technology with minimal risk. Further, between Doyon, Limited and Doyon Utilities, we have the experience, expertise, and resources to develop, own, and operate whatever power and heat solution the Army selects. There is ample precedent to retain utility providers as physical infrastructure is replaced and the law has long allowed contract changes to be part of federal NEPA actions. Accordingly, the EIS should identify Doyon Utilities as the utility provider under each of the alternatives and include any required amendments to the UP Contract (*e.g.*, for new equipment or associated financing obligations) as part of the Army's NEPA action.

An Army commitment to maintain Doyon Utilities as your UP owner and provider will respect the letter and the spirit of the UP contract, continue the socio-economic benefits that the UP Contract provides to Doyon, Limited and our 20,000 shareholders, and allow the Army and Fort Wainwright to continue to benefit from the experience, expertise, and leadership that Doyon Utilities has built over the past 12 years. Moreover, depending upon the alternative that the Army selects, it will avoid disruption during transition to a new technology, and avoid costs (including through Doyon Utilities advocating for less severe and expensive emissions control equipment based upon Doyon Utilities' role as the permittee, experience with the CHPP and our enduring relationships with Alaskan environmental and regulatory bodies). Finally, a continued partnership if a natural gas sourced plant is selected will lower risk during any future transition to a long term and sustainable supply of natural gas.

Thank you again for hosting me and members of the Doyon team last week. I look forward to continuing our dialogue in the near future. We will coordinate with your staff to schedule a follow-up meeting appropriately. Please feel free to contact me at [redacted] or [redacted]

Sincerely,

Aaron Schutt
President and
Chief Executive Officer

CC: The Honorable Ryan D. McCarthy, Secretary of the Army

APPENDIX C

AIR QUALITY AND GREENHOUSE GAS ANALYSIS

Memo

Date:	Monday, March 30, 2020
Project:	FWA Heat and Electrical Upgrades EIS
To:	Paul McLarnon
From:	M. Kirk Dunbar
Subject:	Air Quality and GHG Analysis Methods and Assumptions

This technical memo was prepared to support the air quality and greenhouse gas (GHG) analysis conducted for the Environmental Impact Statement (EIS) prepared for the Fort Wainwright, Alaska (FWA) Heat and Electrical Updates (HEU) project.

This memo discusses the assumptions used to develop the analysis.

Impact of $PM_{2.5}$ Serious Nonattainment Area Status

The area in which FWA is located was redesignated to serious nonattainment status for particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$) on April 28, 2017. The Alaska Department of Environmental Conservation (ADEC) finalized their State Implementation Plan (SIP) to bring the area into compliance with the $PM_{2.5}$ standard on November 19, 2019 that became effective January 8, 2020. ADEC submitted the final SIP to the United States Environmental Protection Agency (USEPA) on December 13, 2019 and USEPA published a completeness determination in the Federal Register on February 11, 2020. As of the date of this memo, USEPA has taken no further official action regarding ADEC's SIP.

Construction Emissions Associated with Each Action Alternative

The EIS is required to include emissions information for both the construction and operational phases of each proposed action. No information is currently available regarding the sequencing of construction, equipment to be used, or area disturbed for any of the Action Alternatives. To fulfill the requirement to evaluate construction emissions, the emissions associated with a previous project at FWA was used as a surrogate for estimate construction emissions for the HEU project.

Operations Emissions Associated with Each Action Alternative

The emissions associated with the operation of each Action Alternative were estimated as summarized in the following items.

- The anticipated amount of fuel associated with each Action Alternative was obtained from the Huntsville study (Reference HEU-EIS-REF-031).
- The emissions associated with Action Alternative 1 were calculated using permitted emission factor information for the new coal boiler operating at the University of Alaska, Fairbanks campus.
- The emissions associated with Action Alternative 2 were calculated using emission factor information from HDR's library of information for similar equipment. Although the amount of No. 2 fuel oil that will be combusted will vary from year to year, the associated emissions were estimated based on an assumption of No. 2 oil operation for 5% of the year.
- The emissions associated with Action Alternative 3 were calculated using emission factor information from the AP-42 emission factor document developed and maintained by the USEPA.
- The amount of No. 2 fuel oil backup associated with Action Alternative 3 is unknown at this point. No information regarding the number of boilers that would have backup fuel capability or the anticipated annual usage of that backup capability is currently available. As such, the emissions associated with use of the backup fuel can be estimated, although they are anticipated to be only marginally higher than the emissions from the natural gas combustion.

Air Quality Impacts and Ice Fog

No modeling was conducted to determine air quality impacts or the impact on ice fog formation of each Action Alternative. The impact that each Action Alternative will have on air quality was qualitatively discussed based on comparison of the mass emissions of each Action Alternative to the actual emissions of the existing central heat and power plant (CHPP). Similarly, the potential contribution of each Action Alternative to ice fog formation was based on a qualitative analysis of the amount of water anticipated to be produced by each as compared to the amount of water produced by the existing CHPP operations.

APPENDIX D

ECONOMIC MODEL APPROACH AND ASSUMPTIONS

Memorandum

Date: November 15, 2019

To: HDR

From: Northern Economics

Re: Economic Model Approach and Assumptions

This technical memorandum is provided in support of the socioeconomic effects analysis provided in the Environmental Impact Statement (EIS) for the Heat and Electrical Upgrades (HEU) in Fort Wainwright, Alaska.

This technical memorandum describes the economic model used in the analysis and the data used as inputs in the model.

IMPLAN Model

The socioeconomic analysis presented in the EIS evaluated the proposed action alternatives with respect to their direct, indirect, and induced effects on employment, income, and business sales (economic output). The effects were quantified using the IMPLAN model.

IMPLAN is an economic impact assessment software system. The model contains data on economic factors, multipliers and demographic statistics for a specific geographic area. IMPLAN allows the user to develop regional-level input-output models that can estimate the economic impact of a project. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships.

For the EIS analysis, the Fairbanks North Star Borough (FNSB) input-output model was used to quantify the regional effects of the proposed project alternatives. The proposed project alternatives involve construction and operations of a new heating and electrical generation system in Fort Wainwright which is located in the FNSB region.

The regional economic effects of the proposed project alternatives were determined by the amount of spending/expenditures associated with the various construction and operations and maintenance activities. Spending on construction and O&M activities generate stimulus effects in the local economy and create additional employment, income, and business sales in the local economy.

Data Sources and Approach

An impact analysis using IMPLAN starts by identifying expenditures in terms of the sectoring scheme for the model. Each spending category becomes a "group" of "events" in IMPLAN, where each event specifies the portion of price allocated to a specific IMPLAN sector. Groups of events can then be used to run impact analysis individually or can be combined into a project consisting of several groups.

The data used for the analysis were obtained from the Life-Cycle Cost Analysis (LCCA) for Heat and Electric Power Alternatives for Fort Wainwright. This study was prepared for the Directorate of Public Works, Utility Privatization Fort Wainwright by the U.S. Army Corps of Engineers Engineering and Support Center, Huntsville Heating, Ventilating and Air Conditioning (HVAC) Technical Center of Expertise. The study report was completed in December 2018.

800 E Dimond Blvd, Suite 3-300 Anchorage, AK 99515 | 1455 NW Leary Way, Suite 400 Seattle, WA 98107 | E-mail: mail@norecon.com www.northerneconomics.com | AK: 907 274.5600 WA: 206.747.8475

The inputs to the model were as follows:

1. Capital Expenditures

The following table shows the implementation and demolition costs for each of the action alternatives in millions of dollars.

Alternative	Implementation Cost	Demolition	Total
Alternative 1	$646.56	$40.00	$686.56
Alternative 2	$322.86	$40.00	$362.86
Alternative 3	$76.70	$40.00	$116.70

The LCCA study defined the implementation cost as the initial construction costs required to implement the alternative.

Details regarding the break-down of capital costs for each alternative were provided as appendices to the LCCA study and these data were used to allocate appropriate construction spending to the different economic sectors in the model. Spending on building/facilities construction and demolition were applied to the construction and maintenance and repair construction of non-residential structures sectors; environmental air quality monitoring costs were applied to the environmental and other technical consulting services sector, and a portion of the equipment costs (mechanical and electrical) were applied to the wholesale trade sector, since these equipment costs were imported from outside the FNSB region.

2. Annual Non-Fuel Operations and Maintenance Costs

The following table shows the estimated annual non-fuel O&M spending for each of the action alternatives.

Alternative	Amount in millions of $
Alternative 1	$16.10
Alternative 2	$8.43
Alternative 3	$1.62

Details regarding the various O&M spending categories were used to apply the spending amounts to the appropriate economic sector in the model. The economic sectors used were fossil fuel generation systems, transmission and distribution systems, wholesale trade for the emission control chemicals under Alternative 1, and maintenance and repair construction sector for the maintenance of the building mechanical rooms.

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June 2020

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