Environmental Assessment

for the

Construction of a Power and Fiber Optic System for Facilities in the Yukon Training Area, Alaska-Phase 2

354th Fighter Wing
Eielson Air Force Base, Alaska
July 2004

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
and
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)
for the
Construction of a Power and Fiber Optic System to Supply Range Facilities in the Yukon Training Area, Alaska Phase 2

Introduction

The 354th Fighter Wing (FW) operates, maintains, and trains combat forces in close air support and interdiction missions in support of the war plans in three operational theaters. The 354 FW's mission is to train and equip personnel for close air support of ground troops in an arctic environment. The range combat training facilities operated by Eielson Air Force Base (Eielson) are some of the finest in the world. Each year the 353rd Combat Training Squadron, based at Eielson, conducts four joint training exercises with Elmendorf Air Force Base, as well as other US Air Force (USAF) units and units from allied countries. The Air Combat Maneuvering Instrumentation (ACMI) system was installed on US Army range lands that comprise Eielson's range facilities. The continued efficient and reliable operation of this range facility and training program is of vital importance to Eielson's mission.

Description of the Proposed Action

The proposed action will result in the construction of approximately 25.7 miles of electrical transmission and fiber optic communication lines in various locations within Fort Wainwright's Yukon Training Area (YTA), Alaska. The fiber optic cable would be collocated on the power line poles, with the point of origin at the Cope Thunder range operations facility on Flightline Avenue. This power and communications system will significantly enhance the operational efficiency and reliability of the range, as well as cut operational costs by replacing expensive constant run diesel generators and propane gas fired power systems.

Alternatives to the Proposed Action

One alternative to the proposed action was identified. Alternative 1 would replace the existing constant run generators with a wind generation system located at Hill 3265. The diesel generators would still be kept in place, but would only run when the wind-generated power was not available.

No Action Alternative

The no action alternative would result in continued operation of existing facilities. The radar facility at Hill 3265, as well as other intermediately located facilities would continue to be powered exclusively by continuous run diesel generators and propane gas fired systems. The scheduled repair/replacement program would still be undertaken under this scenario, as it would be essential for the long-term operation of the range systems to maintain existing infrastructure.

Environmental Impacts of the Proposed Action

Wetlands

No impacts to wetlands would result from construction of the proposed action. Power line routes were rerouted to avoid all wetlands in the area.

Biological Resources

Impacts to biological resources from the proposed project are expected to be minimal. The power line will follow an existing road right-of-way. Relatively little clearing will be done to install the line, and where clearing is needed it will be done by hydro-axe or hand tools. This clearing will likely enhance the right-of-ways as browse habitat, especially for moose and snowshoe hare.

Threatened or Endangered Species

There are no threatened or endangered species in the project area. The project area is not suitable habitat for any of the threatened or endangered species occurring in the Alaskan interior.

Historical or Cultural Resources

The entire proposed power line corridor from Pole Hill to Hill 3265 was surveyed this summer and no sites were found that are eligible for listing on the National Historic Register. In the event that historic or cultural sites are discovered during project construction, activities will be halted and a professional archeologist will evaluate the find before further construction would commence.

Air Quality

The proposed action will have minor air quality impacts during construction due to fugitive dust and machinery exhaust. Such impacts will be highly localized and temporary in nature. In the long-term, the air quality of the area will be improved due to reduced emissions from diesel generator operation.

Mitigation

No mitigation was required by state and federal agencies for any aspect of the proposed work.

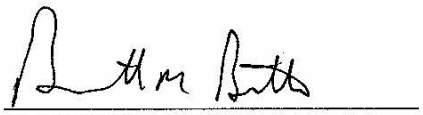
Public Comment

No public comment was received from the public noticing of the Draft EA/FONSI for this project.

Findings

Pursuant to the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) implementing regulations for NEPA (40 CFR Part 1500-1508), and Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (32 CFR Part 989), the Air Force has conducted an EA for construction of the Phase 2 portion of the power and fiber optic communication line in the YTA range. This FONSI has been developed pursuant to information provided in the accompanying EA.

Finding Of No Significant Impact: Based on this environmental assessment, which was conducted in accordance with the requirements of NEPA, CEQ, and Air Force Instructions, I conclude the construction of the Phase 2 power and fiber optic communication system in the YTA range will not result in significant impacts to the environment. I also find that the preparation of an environmental impact statement is not warranted.



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BENNETT M. BITLER
Colonel, USAF
Vice Commander

Date

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Environmental Assessment
for the
Yukon Range Power and Fiber Communications System, Phase 2

1.0 Purpose and Need for Action

Section 1.0 provides a description of the purpose and need for the proposed action.

1.1 Background and Objectives for the Proposed Action

1.1.1 Eielson Air Force Base (Eielson) was established in 1944 and is currently part of the Pacific Air Forces (PACAF) Command. The 354th Fighter Wing (FW) operates, maintains, and trains combat forces in close air support and interdiction missions in support of the war plans in three operational theaters. The 354 FW's mission is to train and equip personnel for close air support of ground troops in an arctic environment. The 168th Air Refueling Wing (ARW) is the primary tanker unit of the Pacific Rim, annually transferring over 17 million pounds of fuel in flight to predominantly active duty aircraft.

1.1.2 In support of their mission, the host unit at Eielson, the 354 FW operates F-16 Fighting Falcon aircraft and A/OA-10 Thunderbolts. The 168 ARW is also based at Eielson and currently flies KC-135 aircraft.

1.1.3 In the early and mid 1990's, the United States Air Force (USAF) established in Alaska an advanced, instrumented air-to-air and air-to-ground training and bomb scoring range to support Pacific Air Forces (PACAF) operations in general and specifically the 354 FW at Eielson. The Air Combat Maneuvering Instrumentation (ACMI) system was authorized by Congress to facilitate changes in the force structure of the USAF. The move was also intended to support an increase the number of large force exercises and joint training exercises conducted in Alaska.

1.1.4 The range combat training facilities operated by Eielson are some of the finest in the world. Each year the 353d Combat Training Squadron (CTS), based at Eielson, conducts four joint training exercises with Elmendorf Air Force Base. Each COPE THUNDER exercise is a multi-service, multi-platform coordinated, combat operations exercise tailored to the operational capability of participating units. The exercise has grown into PACAF's "premier simulated combat airpower employment exercise." All COPE THUNDER exercises take place over Alaskan and Canadian airspace. The entire airspace is made up of 17 permanent military operations areas and high altitude training areas, plus two restricted areas, for a total airspace of more than 66,000 square miles. The continued operation of this range facility and training program is of vital importance to Eielson's mission.

1.1.5 The ACMI system was constructed primarily on military lands within existing ranges in the interior of Alaska. A portion of the system is located in Fort Wainwright's Yukon Training Area (YTA) east of Eielson lands. Currently, continuous run diesel generators and/or propane gas powers all remote components of the ACMI system. The operation and maintenance of these types of power systems is expensive, manpower intensive, and results in significant periods of

operational downtime. To increase reliability and reduce maintenance costs, Eielson is proposing to extend power and fiber optic lines to increase coverage to portions of the YTA that were not covered by Phase 1 construction. Phase 1 construction, currently underway, will provide 27 miles of power and fiber optic lines that will connect Pole Hill and Camera Site II to the Eielson power grid.

1.2 Location of the Proposed Action

1.2.1 Eielson is located in the Tanana River Valley on a low, relatively flat, floodplain terrace that is approximately 2 miles north of the active river channel. Other communities near Eielson include Moose Creek to the north and Salcha to the south. Base lands include 19,790 contiguous acres bounded on the west by the Richardson Highway and on the north and east by Army's YTA. To the south, the community of Salcha borders Eielson.

1.2.2 Fort Wainwright's YTA is located just east of the Eielson line and is approximately 30 miles east/southeast of Fairbanks, Alaska (**Figure 1**). The YTA contains approximately 260,000 acres and is located within the Fairbanks North Star Borough. The proposed electrical transmission line would be constructed adjacent to existing road systems in the YTA.

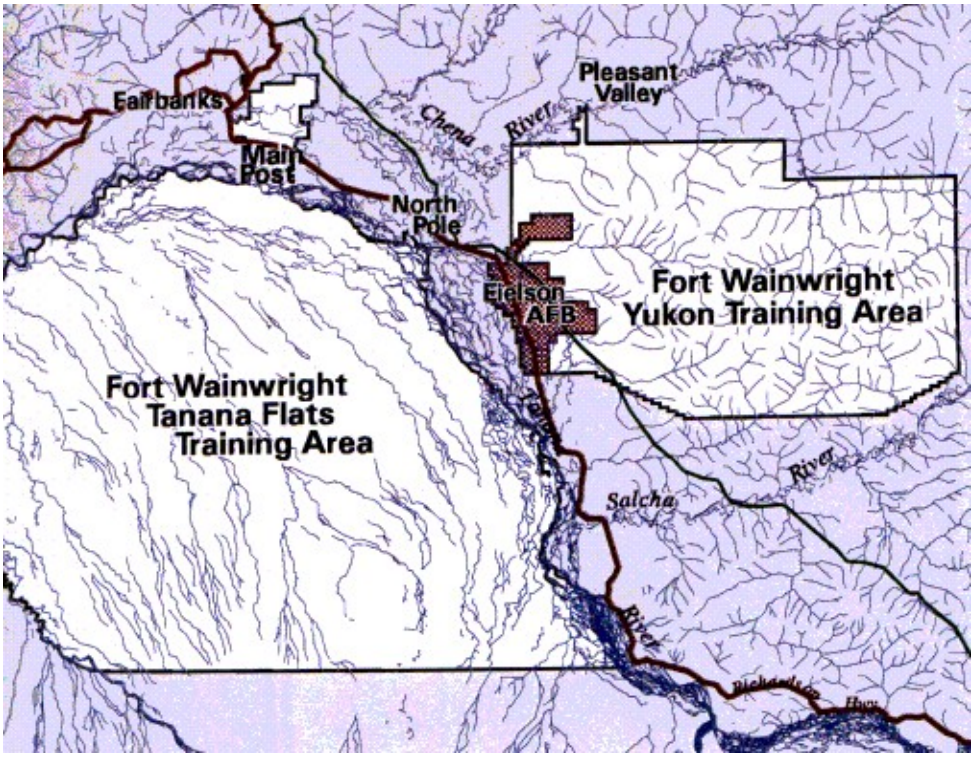

Figure 1 – Location of Project Area

1.3 Proposed Action

1.3.1 Eielson is proposing to construct approximately 25.7 miles of electrical transmission lines in the YTA. This work would include 21.8 miles of line from the Pole Hill facility to Hill 3265 and another 3.9 miles of lines for spurs that would connect existing range facilities to grid lines

currently being constructed within YTA. In addition, a fiber optic communications cable would be collocated on the power line poles. These communications lines would connect with lines currently under construction that have a point of origin at the COPE THUNDER range operations facility on Flightline Avenue. This power and communications system will significantly enhance the operational efficiency and reliability of the range, as well as cut operational costs.

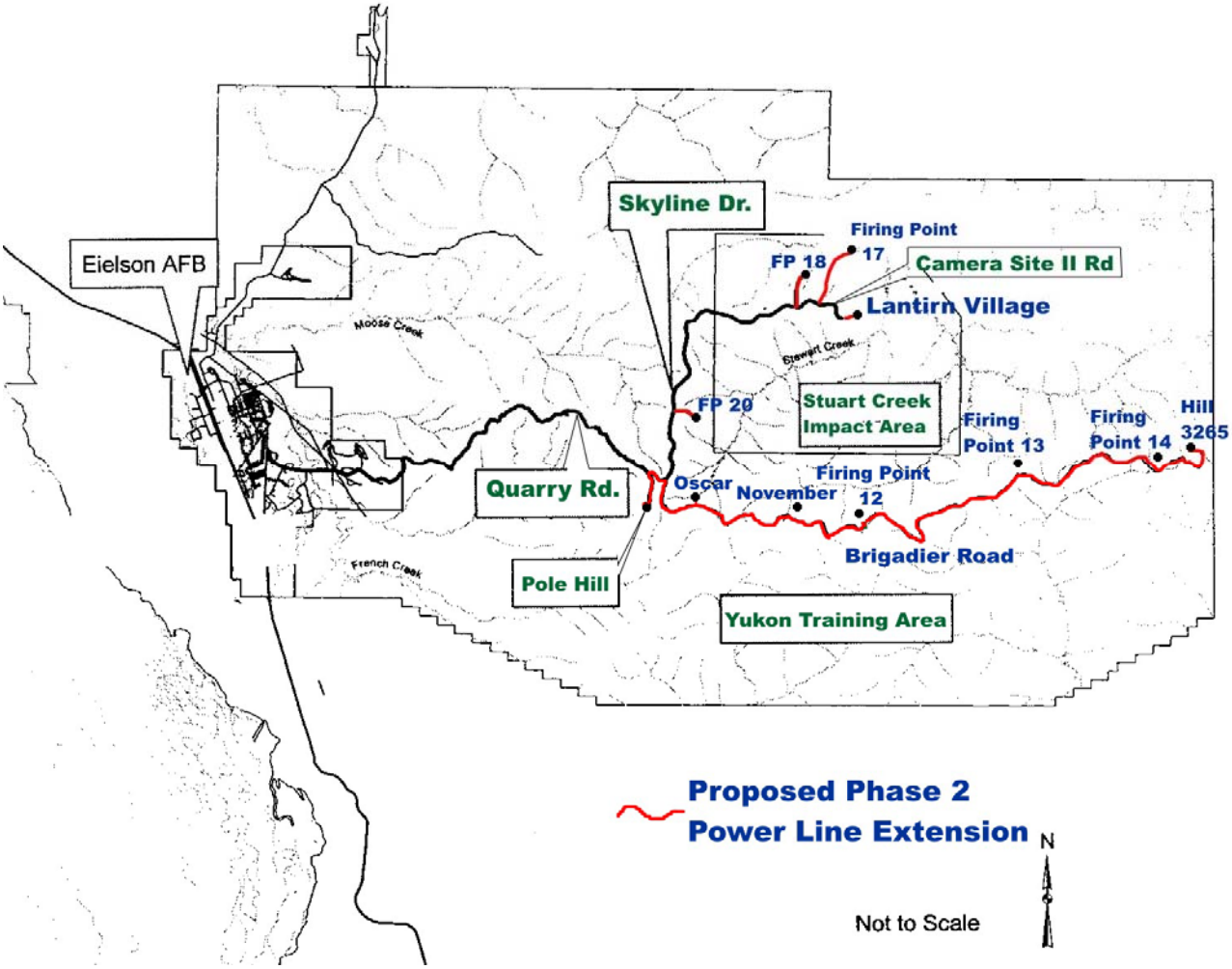

Figure 2 – Power Line Project Location and Routing - Proposed Action

1.3.2 The power and fiber optic cable system would be comprised of one main segment and 5 small spurs (see **Figure 2**). The main segment would run between the Pole Hill communications facility and Hill 3265, a major radar site. This segment would be approximately 21.8 miles in length. In addition, short runs of cable would connect the main trunk line with 5 operating unmanned threat emitters (UMTEs), with runs varying between 0.3 miles to 1.2 miles in length.

1.4 Alternatives to the Proposed Action

In addition to the proposed action, one action alternative, and the no action alternative, are considered for analysis in this EA.

1.4.1 Alternative 1 – Installation of a Wind Energy System with Diesel Powered Backup Generators

Under this alternative, a 50-kW wind turbine mounted on a 172-foot guyed-lattice tower would be installed at Hill 3265. A diesel powered backup generator with automatic start would be incorporated into the system to provide power during periods of low wind. The facilities along Brigadier Road between Pole Hill and Hill 3265 would be operated by a combination solar and propane fired system. Spurs that would be connected along Skyline Road would be connected into the hard-wired electrical grid that is currently being constructed between Pole Hill and Camera Site II (see **Figure 1**).

1.4.2 No Action Alternative

1.4.2.1 The no action alternative would result in continued operation of existing facilities with current power systems remaining in place. Hill 3265 would continue to be powered exclusively by continuous run diesel generators. All UMTE sites currently not scheduled for connection to the Eielson power grid this summer will remain powered by solar and propane systems. The scheduled repair/replacement generator program would still be undertaken with this scenario, as it would be essential for the long-term operation of the range systems to maintain existing infrastructure.

1.5 Decision to be Made

1.5.1 As required by 32 C.F.R. Part 989, the *Environmental Impact Analysis Process* was used to determine the environmental consequences of the proposed construction of power and fiber optic lines in portions of the YTA. This Environmental Assessment (EA) is intended to satisfy these requirements. The proposed action and all alternatives listed in Sections 1.3 will be addressed in detail in Chapter 2.0 of this document. A description of the resources associated with the areas affected by all alternatives will be provided in Chapter 3.0 and the impacts that could result from each one are discussed in Chapter 4.0.

1.5.2 Based on the evaluation of impacts in the EA, a Finding Of No Significant Impact (FONSI) will be published if there is a finding of no significant environmental impacts for the proposed action. If it is determined that the proposed action will have significant environmental impacts, other alternatives will be considered for which impacts may not reach the threshold of significance.

1.5.3 The EA, a draft FONSI (if applicable), and all other appropriate planning documents will be provided to the Eielson Vice Commander, the decision maker, for review and consideration. If, based on a review by the decision maker of all pertinent information, a FONSI is proposed, a notice of intent (NOI) will be published in accordance with 40 CFR 1506.6. All interested parties will have 30 days to comment on the decision to the Air Force. If, at the end of the 30-

day public comment period, no substantive comments are received, the decision maker will sign the FONSI.

1.6 NEPA Actions That Influence This Assessment

1.6.1 *Alaska Army Lands Withdrawal Renewal-Final Legislative EIS, U.S. Army 1998*
This EIS assesses the environmental consequences associated with the continued military use of U.S. Army lands and the renewed withdraw of those lands including the Fort Wainwright Yukon Maneuver Area.

1.6.2 *Fort Wainwright Resource Management Plan and Final EIS, U.S.D.I., Bureau of Land Management, 1989 and Integrated Natural Resources Management Plan 1998-2002 U.S. Army Alaska Volume 3 Fort Wainwright.* These documents provide summaries of alternate resource management plans for the Fort Wainwright Yukon Maneuver Area.

1.6.3 *Integrated Natural Resources Management Plan, Eielson Air Force Base, 2003.*
This document addresses natural resource management on Eielson Air Force Base and provides guidance for management activities and long-range planning on Eielson managed lands.

1.6.4 *Construction of a Power and Fiber Optic System for Facilities in the Yukon Training Area, Alaska, 2003.* This document addresses the proposal to construct a power and fiber optic communications system for portions of the YTA. Many issues that are currently being considered were discussed in this EA.

1.7 Project Scoping/Significant Issues

This section provides a summary of all the issues raised during the scoping process. The scoping process identifies relevant issues and establishes the limits of the environmental analysis. Scoping meetings were held on numerous occasions to discuss the proposed action and alternatives to the proposed action. These meetings involved Air Force communications squadron personnel, Cope Thunder range operations, Army range managers, and federal and state resource agency personnel. The topics listed below were issues identified as relevant to the analysis process and will be addressed in detail in this document in Chapters 2, 3, and 4.

1.7.1 *Hazardous Material Releases*: Concerns about the present systems potential for a hazardous materials release. Current operations include precautions taken to prevent a release of hazardous materials (fuel, oil, and antifreeze) associated with operation of generators. These precautions include spill pallets under generators, use of a double walled fuel tank, and interstitial and product monitoring on the fuel tank. Even with these precautions, a malfunction in a generator or mishandling of fuel has caused hazardous material releases in the past. Three hazardous material releases of reportable quantity have been recorded in the past two years.

1.7.2 *Air Quality*: The generators must run continuously causing a release of diesel exhaust to the surrounding atmosphere.

1.7.3 *Wildlife*: Due to the presence of wildlife in the project area, direct and indirect impacts to individual species must be considered. Potential impacts include alteration or loss of habitat and unintentional taking of wildlife. Actions such as the construction of power lines or installation of a wind generator have the potential to result in unintentional taking due to bird strikes on towers.

1.7.4 *Mission Integrity*: USAF staff expressed concerns about the reliability of the existing system in providing power to a crucial communication site. The mission integrity would be jeopardized by the loss of training and tracking data in the event of a power failure.

1.7.5 *Economic Considerations*: As with any public entity, the Air Force must take into consideration the cost-effectiveness of the various options. For this reason, economics of the alternatives will be considered as a part of the overall decision.

1.8 Federal and State Permits or Licenses Needed to Implement the Project

1.8.1 The proposed action and alternative 1 would result in placement of structures on United States Army Alaska (USARAK) lands. The USAF would be responsible for procuring the necessary land use permit from the Army.

1.8.2 A Section 106 clearance from the State Historic Preservation Office will be required for this project.

2.0 Description of the Proposed Action and Alternatives

Section 2.0 provides a description of the proposed action and alternatives considered to achieve the purpose and need described in Section 1.0. The proposed action, alternative 1, and the no action alternative are addressed.

2.1 Proposed Action – Construct Power and Fiber Optic Lines From Pole Hill to Hill 3265

2.1.1 The proposed action would result in the construction of a power and communication line distribution system that would extend from Pole Hill to Hill 3265, as well as five short spurs from power lines that are currently under construction along Skyline Drive to Camera II. These short spurs would result in an additional 3.9 miles of power lines. The system would provide 7,200-volt, three-phase power to Hill 3265.

2.1.2 The power cables will be hung on standard treated wood poles with cross members. The poles will be placed with spacing between 250 feet and 300 feet, depending on the terrain. The poles will be installed by auguring a 24-inch-wide hole to the appropriate depth (approximately 7 feet). The pole will be set with gravel material used as backfill (see **Figure 3**).

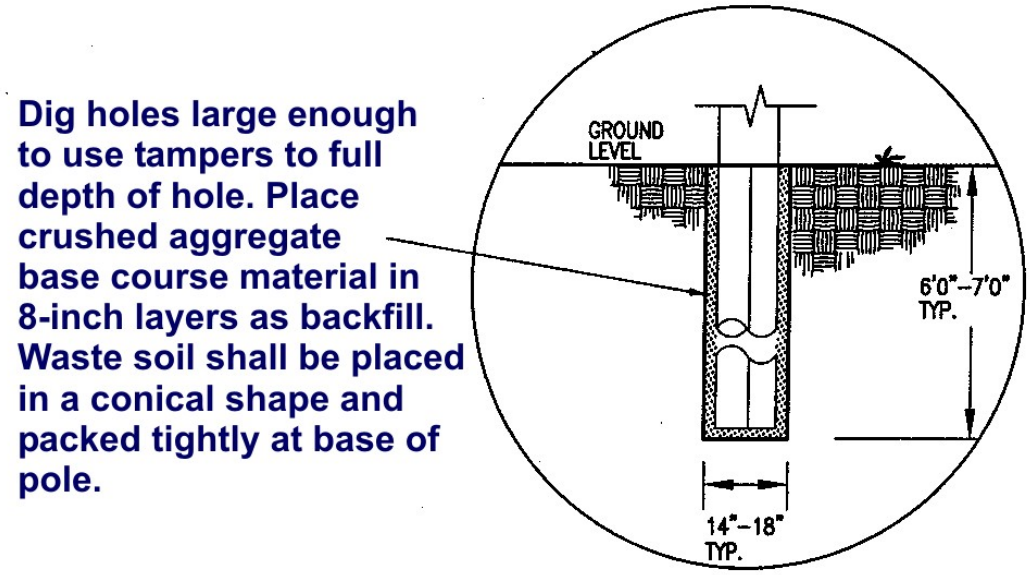

Figure 3 – Typical Power Pole Excavation Detail

2.1.3 In addition to the power cables, the distribution poles will carry a 48 fiber, single-mode fiber optic cable to allow for current and future expansion of the communications capabilities to these remote sites.

2.1.4 Most of the power poles will be set right at the toe of the existing roadbed with a right-of-way configuration similar to that depicted in **Figure 4**. In areas where it deviates from this, and

the areas have not been previously cleared of trees, a hydro-axe will be used to clear the right-of-way. Some hand clearing of trees my be needed in selected situations.

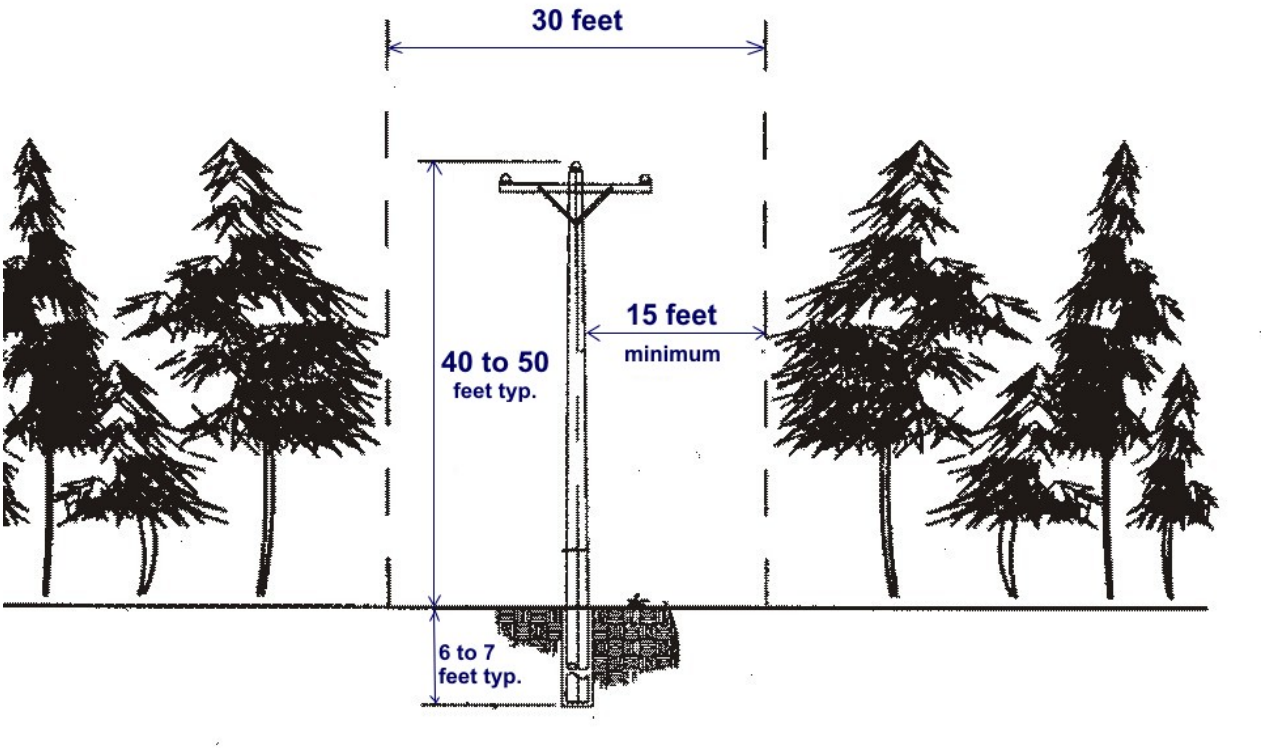

Figure 4 – Typical Pole Placement and Right-of-way Configuration

2.2 Alternative 1 – Installation of a Wind Energy System with Diesel Powered Backup Generator

2.2.1 Under this alternative, a 50-kW wind turbine generator would be installed at the Hill 3265 radar facility.

2.2.2 A 50-kW wind turbine would provide the primary electrical load. During periods of high wind, the wind turbine would create more power than is being consumed at both sites. This excess energy would be stored in a battery bank for use during periods of low wind. If the battery voltage falls below a pre-set limit the back-up diesel generator would automatically start and operate until the batteries reach full charge.

2.2.3 The wind turbine would be an up-wind, horizontal-axis, three-blade turbine (**Photo 1**). The blades would have an approximate 46-foot rotor diameter and be rated at 50-kW at a wind speed of 25 miles per hour (11 meters per second). The wind turbine would produce a direct current (DC) that would be converted into alternating current (AC) by use of a DC-AC inverter. The wind turbine would be capable of providing

240-volt, three-phase power.

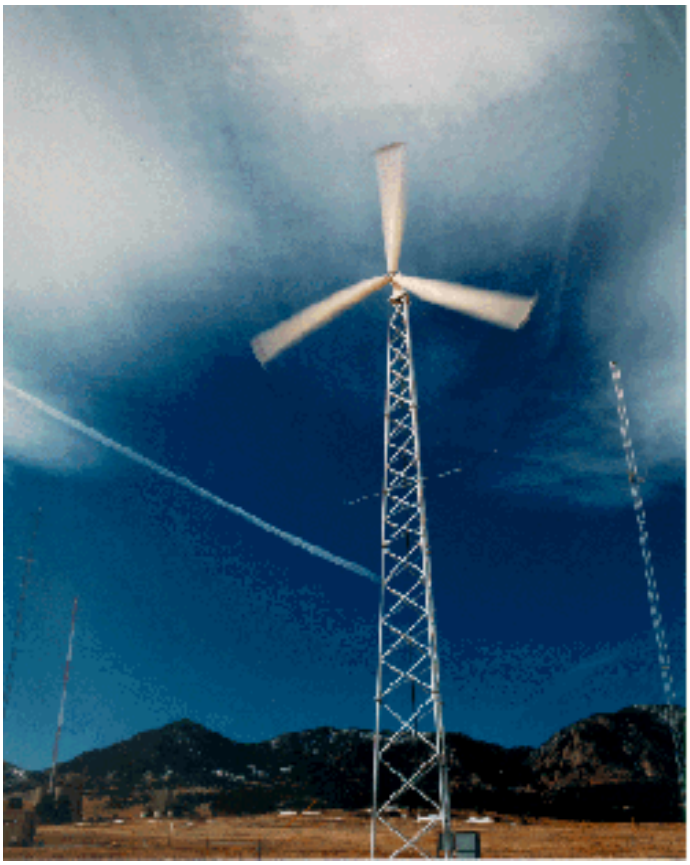

Photo 1 – Typical 50-kW Wind Turbine

2.2.4 The wind turbine would be mounted on a 170-foot guyed lattice tower. The tower would be placed on a 10-foot by 10-foot concrete sub-base and be supported by guy wires. A 50-foot diameter area would be cleared of vegetation for installation of the guy wires and tower.

2.2.5 The wind tower and turbine would be located within 0.25 mile of the Hill 3265 radar site. The results of a siting analysis would determine the exact placement of the wind generator. Factors taken into consideration would be the roughness of terrain, local wind velocity and density measurements, presence and height of surrounding vegetation, migration routes, and line of sight measurements for microwave transmissions.

2.2.6 A 10-foot by 40-foot steel conex type container would be required to house the protective fuses, controls, monitoring equipment, and storage batteries for the energy system. This would be located next to the Hill 3265 radar facility building.

2.2.7 The storage battery bank would consist of a string of 80, 12-volt, 1,500-amp hour, deep cycle batteries. The gel-celled lead-acid battery bank would be capable of supplying an 8-hour electrical energy reserve.

2.2.8 The diesel generator would be a 40-kW diesel generator with automatic controls that would allow the unit to start during low battery voltage conditions. The diesel unit would power the communications site and automatically turn off when battery bank is fully charged.

2.3 No Action Alternative

2.3.1 No changes would be made under this alternative. The Hill 3265 communication and relay site would continue to be operated by diesel generators. Current maintenance and refueling activities would continue and a scheduled repair/replacement program would be implemented.

3.0 Affected Environment

Chapter 3 describes the existing environment and resource components that would be impacted by the proposed project and the alternatives. The resources discussed in this section are presented as a baseline for comparisons of environmental consequences.
Resources discussed in the section are as follows:

- Physical Resources, which includes general site location and topography, geology and soils, climate and air quality, ground and surface water, wetlands, and infrastructure improvements.
- Biological Resources, which includes vegetation, wildlife, fish, threatened or endangered species.
- Cultural Resources including Archeological or Historical Resources.
- Recreational Resources.
- Socioeconomic Factors.

3.1 Physical Resources

The topography of the proposed project is typical of the Yukon –Tanana Upland of the Northern Plateau physiographic province. The Yukon –Tanana Upland is characterized by a series of rounded, rolling hills, rising 700 to 3,000 feet above mean sea level. The elevation ranges from 2,483 feet at Pole Hill, 2380 feet at Camera Site 2, and 3,265 feet at Hill 3265. Gentle side slopes and broad undulating divides typify the area. The valley floor is classified as alluvium basins with valleys in the area ranging from broad to steep/narrow valleys. Several small streams flow through the valley floor in the vicinity including French Creek, which drains the project area to the south and Moose Creek to the north. Most streams originating in the YTA flow south and west to the Tanana River, which is a tributary of the Yukon River.

3.1.1 Geology, Soils, and Permafrost

3.1.1.1 The geology of the area is classified as Precambrian and Paleozoic-age metamorphic rocks of the Yukon-Tanana crystalline complex, formally known as Birch Creek Shist. The rocks have been intruded by igneous rocks of Mesozoic and Cenozoic age referred to as the Eielson plutons. Younger sedimentary Pleistocene and Holocene loess deposits have overlain the igneous and metamorphic rocks. These deposits originated from the floodplain of the Tanana River and the foothills of the Alaska Range. The loess varies in depth from a few inches on the ridge tops to 40 to 100 feet in the valleys.

3.1.1.2 Soils in the upland areas consists of well-drained silty soils, chiefly loess over bedrock, that varies in depth. Upland soils found on south-facing slopes are generally better drained than those found on north-facing slopes. Soils on north facing slopes usually are underlain by discontinuous permafrost.

3.1.2 Climate and Air Quality

3.1.2.1 Eielson and the YTA has the northern continental climate of Interior Alaska, which is characterized by short, moderate summers, long cold winters, and low precipitation and humidity. The mean annual precipitation in the area is 11.2 inches, much of which comes as snow. The coldest month is January, with an average temperature of minus 10.3°F and an average minimum temperature of minus 19.2°F; the warmest month is July, with an average temperature of 61.7°F and an average maximum of 71.9°F. The minimum amount of daylight is shortest in December with 3 hours 47 minutes of available daylight.

3.1.2.2 May and June have the highest winds, with average wind speeds of 7.7 and 7.2 miles per hour, respectively. During most of the year, the prevailing wind direction is from the north at an average of 5.15 miles per hour. However, in June and July, the wind direction is typically from the southwest. Wind speed can vary with elevation and roughness of surrounding terrain. Meteorological data for Hill 3265 including average wind speed and wind density is not available. According to a U.S. wind energy resource map produced by the Department of Energy (DOE), the area is classified as having a wind power class of 2-3. According to DOE wind power classification, a wind power class 1 is rated as having the lowest potential wind energy and 7 the highest for potential wind energy.

3.1.2.3 Air quality is generally good at Eielson and in the adjoining YTA lands. Although portions of the Fairbanks North Star Borough, of which Eielson is also a part, are in non-attainment for carbon monoxide (Fairbanks and North Pole), Eielson is far enough south to not be included or affected. The Clean Air Act designates areas as attainment, non-attainment, maintenance, or unclassified with respect to their compliance with National Ambient Air Quality Standards (NAAQS). Non-attainment and maintenance areas are locales that have recently violated one or more of the NAAQS and must satisfy the requirements of State or Federal Implementation Plans (SIPs or FIPs) to bring them back into conformity with the applicable air quality standards. Eielson is located in an *unclassified* area, and therefore activities that generate emissions do not need to satisfy the requirements of the EPA ruling *Determining Conformity of General Federal Actions to the State or Federal Implementation Plans.*

3.1.3 Ground and Surface Water

3.1.3.1 Groundwater is typically found in small quantities in upland areas in fractures and joints of underlying bedrock. The lack of groundwater in large quantities is attributed to high topographic relief and the well-drained soils found in the area. Groundwater is available in moderate to large quantities from the gravel deposits found in the alluvial plains of stream valleys. The major source of recharge for aquifers is precipitation that enters the ground through infiltration.

3.1.3.2 Most small streams in the area are low-gradient feeder streams that characteristically exhibit low discharges during the winter months and peak discharges during the summer months. The entire Yukon-Tanana Upland area lies within the Yukon River catchment basin. There are no lakes or ponds present in the project area.

3.1.4 Wetlands

3.1.4.1 Even though wetlands are a predominating physical feature found within Eielson and the YTA, the project area is not located in wetlands. A wetlands delineation of the entire route was completed and power poles were located specifically to avoid wetland areas. Wetlands that are found in the area are mainly black spruce stands that are interspersed with small amounts of paper birch and tamarack, as well as, open areas dominated by scrub/shrub stands of dwarf arctic birch and bog rosemary. Understory in most areas includes Labrador tea, lowbush cranberry, and blueberry. Occasionally the black spruce wetlands are interspersed with wet meadows that support emergent aquatic vegetation (sedges, grasses) in conjunction with seasonally persistent shallow open water areas.

3.1.4.2 Wetlands in the more elevated rolling hills portion of the project area are generally isolated pockets of black spruce or scrub/shrub wetlands created by perched water tables resulting from discontinuous permafrost.

3.2 Biological Resources

3.2.1 Vegetation

3.2.1.1 Due to the variations in the surrounding terrain, the plant communities vary due to slope orientation, changes in elevation, and fire history. Changes in vegetation are also influenced by spatial differences in soil temperature, moisture content, soil fertility, and presence of permafrost. The major plant community types include white and black spruce coniferous forests; paper birch and poplar broadleaf forests; mixed coniferous-broadleaf forests; tall scrub-shrub; and herbaceous wetlands. The two most common types are upland mixed spruce/broadleaf forest and black spruce lowland forest.

3.2.1.2 Upland mixed spruce/broadleaf forest tends to occur on well drained-sites with little permafrost. This forest type is commonly found on south-facing slopes. Tree species include white spruce, paper birch, quaking aspen, and balsam poplar. Willows, alder, wild rose, blueberry, and high-bush cranberry are common shrubs. Ridge tops with higher elevations usually consist of a tall shrub community characterized by dwarf birch and herbaceous species with widely scattered black spruce. Mixed forests usually develop from stands of pure or nearly pure broadleaf trees such as birch. As the slower growing spruce reach the canopy, the relatively short-lived birch and other broadleaf species begin to mature and die. Mixed forests eventually develop into stands of pure spruce as the broadleaf trees, whose seedlings are relatively shade intolerant, continue to drop out without replacement. In some cases, the resultant spruce stand may be fairly open if spruce regeneration is insufficient to maintain a closed overstory canopy. Moderate to heavy wildfire will return this forest type to a relatively pure stand of young broadleaf trees. Birch trees are capable of extensive sprouting, or *suckering*, from the root collar following fire.

3.2.1.3 Black spruce lowland forest tends to occur on poorly drained sites underlain by permafrost. Black spruce forest is common in low-lying areas, drainage basins, and north-facing slopes. Black spruce occurs in closed canopy stands and as scrubby open stands of dwarf trees. Other species commonly occurring in this forest type include tamarack, blueberry, low-bush cranberry, Labrador tea, and feather moss. Closed canopy black spruce forest tends to return to

its original composition after fire (Viereck et al., 1992). In the absence of fire, closed canopy black spruce may transition into scrubby open stands of black spruce as the moss layer thickens. A thicker mat of moss tends to better insulate soils, causing the permafrost level to rise and the soil to be colder and wetter over time.

3.2.1.4 The entire western portion of the YTA receives full wildfire protection as determined by the Interagency Fire Management Plan. Under full wildfire protection, fires receive aggressive initial attack dependent upon the availability of suppression resources. The objectives are to control all fires at the smallest acreage reasonably possible initially and to minimize disruption of planned or ongoing human activities in the area.

3.2.2 Wildlife

3.2.2.1 Wildlife species in the surrounding areas are typical of those found in interior Alaska. Large mammals that are likely to be found in nearby habitat include moose, red fox, black bear, snowshoe hare, red squirrel, lynx, marten, wolverine and coyote. Gray wolves are transient to the area.

3.2.2.2 Migratory waterfowl is scarce in the area due to a lack of open water. However, other migratory birds common to interior Alaska including gulls, swallows, thrushes, sparrows, and warblers, can be found in the area. Non migratory birds include ravens, jays, chickadees, songbirds, woodpeckers, grouse, and ptarmigan. Raptors include bald and golden eagles, hawks, kestrels, great horned owls, boreal owls, and hawk owls.

3.2.2.3 Recreational hunting of big and small game species in non restricted areas is an important activity. Big game species include moose and black bear. Hunting of small game includes snowshoe hare, red squirrel, grouse, and ptarmigan.

3.2.3 Fish

French Creek and Moose Creek are shallow, gravel bottomed streams that run with clear water for most of the year. The creeks contain northern pike, arctic grayling, whitefish, chum salmon, burbot, and rainbow trout. Little information is available about fish and fish habitat in tributaries of French Creek and Moose Creek.

3.2.4 Threatened or Endangered Species

3.2.4.1 There are no known threatened or endangered species within the proposed project area. However, the proposed project site is within the range of the American peregrine falcon (*Falco peregrinus anatum*), which was removed from the list of threatened and endangered species in 1999. Peregrine falcon's nests have been located on the Salcha and Goodpasture River drainages to the southeast, and the Charley and Yukon River drainages to the northwest of the proposed project area. The American peregrine falcon is known to nest in the Salcha River Bluffs located approximately 15 miles to the south. Potential peregrine falcon habitat is not found within the nearby Stuart Creek Impact Area, and none have been observed nesting in this area. Another

federally delisted subspecies, the Arctic peregrine falcon (*Falco peregrinus tundrius*), is not known to nest within several hundred miles of the area. The only occurrence of either subspecies in the proposed project area is transitory during migration periods.

3.2.4.2 Due to its recent recovery from endangered status, the U.S. Fish and Wildlife Service will monitor the American peregrine falcon on a regular basis for the next decade. If survey data indicate a reversal in recovery, the American peregrine falcon could be emergency listed at any time. Therefore, the Fish and Wildlife Service recommends agencies avoid impacts to peregrine falcons to assure a healthy long-term population.

3.2.4.3 No federal or state listed threatened or endangered plant species have been listed as occurring within Eielson or Fort Wainwright YTA.

3.3 Cultural Resources

3.3.1 Archeological and Historical Resources

3.3.1.1 As part of the development of an Integrated Cultural Resources Management Plan (ICRMP) for Army managed lands in the State of Alaska, the U.S. Army began an inventory of all archeological and historic sites contained on their lands in 1984. In addition, as part of the preliminary siting work for the range upgrade and expansion projects proposed in conjunction with the deployment of the Stryker Brigade at Ft. Wainwright, cultural resource surveys were completed for the entire power line right-of-way area, outside of the Stuart Creek Impact Area. Areas within the impact area are exempt from survey requirements. The results of this survey indicated no sites eligible for listing on the National Register of Historic Places were found.

3.3.1.2 In 1994, Eielson developed a predictive model for identifying areas on base with a high probability of prehistoric significance. This model (Mason et al., 1994) was designed to provide baseline information for planning and land management on base. The model incorporated a variety of information into predictions of locations and potential characteristics of historic properties. The predictive model was used as a basis for conducting an extensive field survey of high probability areas. The field survey, summarized in a report entitled *Archaeological Survey and Assessment of Prehistoric Cultural Resources on Eielson Air Force Base, Alaska Management Summary* (Gerlach and Bowers, 1996), was conducted within three high probability areas. However, no significant prehistoric archeological or historic sites were found in any of the three high probability areas.

3.3.1.3 In addition to archeological surveys completed in prior years, surveys were scheduled for the summer of 2004 to survey all remaining portions of the proposed power line right-of-way. As of the writing of this EA, all portions of Brigadier Road between Pole Hill and Hill 3265 have been completed with no findings of sites eligible for the National Historic Register. A report is being prepared and will be available to the State Historic Preservation Office by September 1, 2004 to satisfy Section 106 consultation requirements. No work associated with this EA will be undertaken until May of 2005, allowing ample time to complete coordination. If any issues are identified, all areas in question will be provided the appropriate level of protection. Power line rights-of-way will be adjusted to avoid all areas for which protection is required.

3.4 Recreational Resources

3.4.1 The YTA lands are used extensively for outdoor recreation. Popular forms of recreation include hunting, trapping, off-road vehicle use, and snowmobile use (BLM, 1994). Residents of Eielson are the primary users, presumably because of the proximity of their homes to these areas. Although it is open to all users, military and civilian alike, the general public feels uneasy about driving into an area with warning signs, restrictions, and requirements for permits (BLM, 1994). In addition, access for the general public is somewhat limited.

3.4.2 Hunters, fishermen, and trappers are required to attend a safety briefing and to obtain a permit prior to using military lands. Hunters in the YTA harvest an average of 53 moose per year with 2 moose per year harvested by hunters on Eielson (bow hunting only).

3.5 Socioeconomic Factors

3.5.1 The area surrounding the proposed project is utilized primarily by the military as a transportation corridor to access military facilities located within the YTA. The area is not heavily used by the general public. The proposed electrical transmission line is not located near any population centers that are inhabited disproportionately by minorities or low-income groups.

4.0 Environmental Consequences

Chapter 4 is organized by resources, with the environmental consequences evaluated for each alternative. This discussion will provide a scientific and analytic basis for the comparisons of the alternatives and describes the probable consequences (impacts and effects) of each alternative on selected environmental resources. The effects of each alternative upon each resource are discussed in the same order that they were presented in Chapter 3, beginning with the proposed action. Impacts that are common to all alternatives are stated as such and are addressed in the appropriate sections.

4.1 Physical Resources

4.1.1 Geology, Soils, and Permafrost

4.1.1.1 Proposed Action

4.1.1.1.1 In those areas where the existing road corridor does not provide an open right-of-way, removal of vegetation for transmission line installation would be accomplished with a hydro-axe, but would not result in a disturbance to soils other than minor compaction. The primary disturbance to soils would result from the auguring of holes for the installation of 452 utility poles and guy wires. Approximately 452 cubic yards of soil (approximately one cubic yard per pole) would be disturbed and displaced with the installation of the utility poles. Installation for each utility pole would create a spoil amount of approximately one cubic yard of native soil. The excess soils would be spread out over a 6-foot diameter area around the pole and would naturally revegetate with native grasses and ground covers. Erosion impacts would be negligible.

4.1.1.1.2 Soil compaction could occur during construction due to off-road movement of pole drilling equipment. However, soil disturbance should be minimal since the entire project is located in uplands and the pole sites will be accessed primarily from the existing roadbed.

4.1.1.2 Alternative 1

4.1.1.2.1 Approximately 24 cubic yards of soils would be excavated as part of the construction of a 10-foot by 10-foot by 3-foot thick concrete pad for the wind turbine tower at Hill 3265. The soils removed would be evenly distributed around the base and would naturally revegetate with native grasses and ground cover. Erosion would be negligible.

4.1.1.2.2 Soil compaction could occur during construction due to heavy equipment use at the site. However, these disturbances should be minimal since the tower would be located in uplands.

4.1.1.3 No Action Alternative

There would be no additional disturbance to soils under this alternative. However, the potential for soil contamination may be greater with this alternative due to risks associated with fuel transfer spills and accidents in operating the constant run diesel generator that would be part of maintaining the existing system of power generation. Three hazardous material releases of reportable quantity have been recorded in the past two years associated with the operation of the generators. The USAF and USARAK will continue to respond to hazardous spills in cooperation with State and Federal agencies.

4.1.2 Climate and Air Quality

4.1.2.1 Proposed Action

4.1.2.1.1 The proposed power upgrade to YTA facilities would eliminate most use of diesel generators. The backup generators would only be required during power failures. The overall air quality in the vicinity of Pole Hill would improve due the reduction in emissions caused by the diesel generators.

4.1.2.1.2 Air quality may be temporarily diminished during construction due to emissions produced by construction equipment. Airborne particulate matter in the form of dust emissions may also increase if the construction occurs during dry summer months.

4.1.2.2 Alternative 1

4.1.2.2.1 Under this alternative, a 50-kW wind generator would be installed at Hill 3265. A diesel powered backup generator with automatic start would be incorporated into the system to provide power during periods of low wind. Overall air quality in the vicinity of Hill 3265 would improve due to reduced run time of the diesel generators. The reduction in emissions at each site is dependent upon the amount and consistency of electric power produced by the wind turbines. Thus, air quality would fluctuate depending upon wind power availability.

4.1.2.2.2 Electricity produced by wind generation would emit no emissions to the environment. It is estimated that the 50-kW wind generator would displace approximately 100 tons of carbon dioxide produced annually from other electric sources such as a coal-burning power plant (Environmental Emissions from Energy Technology Systems: U.S. Dept. of Energy, 1989).

4.1.2.2.3 Air quality may be temporarily diminished during construction due to emissions produced by construction equipment. Airborne particulate matter in the form of dust emissions may also increase if the construction occurs during dry summer months.

4.1.2.3 No Action Alternative

There would be no changes to the existing air quality under the no action alternative. This alternative would produce more emissions at Hill 3265 than the proposed action or alternatives 1 due to emissions produced by the constant run generators that would remain in place.

4.1.3 Ground and Surface Water

4.1.3.1 Proposed Action

The proposed action would likely result in reduced risk of impacts to both groundwater and surface water. Over the years that the range facilities have been in operation, several fuel spills have occurred while operating and fueling the generator systems. With only backup generators being kept, the frequency and amount of fuel that is handled will be significantly reduced.

4.1.3.2 Alternative 1

This alternative would also result in reduced risk of oil spills, as fuel needs would be greatly reduced with the use of wind generation as the primary power source at Hill 3265.

4.1.3.3 No Action Alternative

Under this alternative the continued operation of the constant run generators would likely result in continued minor spills in association with these operations, likely having impacts on surface water resources.

4.1.4 Wetlands

4.1.4.1 Proposed Action

No impacts to wetlands would occur as a result of implementation of the proposed action.

4.1.4.2 Alternative 1

No impacts to wetlands would occur as a result of implementation of alternative 1.

4.1.4.3 No Action Alternative

No impacts to wetlands would occur with this alternative.

4.2 Biological Resources

4.2.1 Vegetation

4.2.1.1 Proposed Action

4.2.1.1.1 Under the proposed action existing vegetation would be impacted as part of the clearing of the transmission line right-of-way. The extent to which this would occur is difficult

to quantify, as a large portion of the right-of-way is already cleared previously as part of the construction of the road corridor. The height and distance of trees from the centerline of the power line right-of-way will determine which trees will need to be removed (see **Figure 4**). The actual amount of vegetation that would be cleared along this route would likely be minimal due to the previously cleared areas adjacent to Quarry Road. Since there is an abundance of similar vegetation types along the proposed project route, the loss of vegetation would likely not have a significant impact on availability of forested habitat in the area.

4.2.1.2 Alternative 1

There would be little or no impact to vegetation from the construction of a wind/solar power system at Hill 3265.

4.2.1.3 No Action Alternative

This alternative would not result in any additional loss of vegetation.

4.2.2 Wildlife

4.2.2.1 Proposed Action

4.2.2.1.1 Loss of forested habitat due to tree removal in the power line corridor would likely have an overall benefit to wildlife such as moose and black bear. The cutting of large mature aspen, balsam poplar, and birch trees causes an increase in root suckers. Creating a clearing for the transmission line may benefit other species such as snowshoe hare, red fox, lynx, and raptors by providing edge habitat. Young saplings and suckers are an important food source for moose and invading grasses and shrubs are a source of food and cover for voles and mice. Removal of standing dead trees however, could decrease nesting habitat for cavity nesting birds, and feeding habitat for birds that utilize insects. No direct impacts to wildlife are anticipated with the proposed construction of the transmission line other than the possibility of minor disruptions to wildlife movement as typically found during the construction phase of projects.

4.2.2.1.2 Electrical lines and utility poles have the potential to result in avian fatalities due to electrocution and bird strikes with utility poles. Most bird electrocutions occur on low voltage distribution systems where the spacing of the electrical conductors is less than 7 feet. The closer spacing is a hazard to raptors and other large birds because their body size and wingspan are big enough to span the distance between the conductor wires, completing an electrical circuit. Another major source of bird electrocution results from pole mounted transformers. A bird landing on top of a transformer can easily contact an energized jumper wire while its feet are on the grounded transformer. Mitigation methods have been incorporated into the design to include adequate spacing between phase conductors and insulating caps on the conductors.

4.2.2.2 Alternative 1

4.2.2.2.1 Possible impact to birds could occur with alternative 1. Effects on bird populations could result from deaths caused by wind turbines. Violations of the Migratory Bird Treaty Act

or the Endangered Species Act, or both, could result if fatalities occurred to protected species. The National Renewable Energy Laboratory (NREL), a DOE organization, is working with environmental groups, government agencies, and other interested parties to address this issue.

4.2.2.2.2 Studies have found that higher levels of mortality have occurred in coastal locations where large concentrations of waterfowl are found or where wind turbines are located in highly used migration corridors. U.S. Fish and Wildlife Service (USFWS) has also presented evidence that higher mortality rates occur with towers greater than 200 feet aboveground and towers that are illuminated with navigational warning lights. The tower used in alternative 1 would be 170 feet and would not have navigational warning lights.

4.2.2.2.3 The USFWS in cooperation with various support agencies have established recommendations to mitigate avian mortality. Recommendations pertinent to this alternative are as follows:

- Users should employ and assess radar and acoustic and ground survey techniques that could then be used to determine major migratory corridors or routes (not necessarily flyway-oriented) to avoid siting towers in these areas.
- Avoid siting towers in or near wetlands, near other known bird concentration areas (e.g., National Wildlife Refuges), or in habitat of threatened or endangered species known to be impacted by towers.
- Guyed towers constructed in known raptor or waterfowl concentration areas should use daytime visual markers (e.g., bird diverter devices) on the guy wires to prevent collisions by these diurnally active species.
- The operator should develop an effective dead-bird monitoring protocol.

4.2.2.2.4 No other impacts to the localized wildlife habitat are anticipated other than the possibility of minor disruptions to wildlife movement as typically found during the construction phase of projects.

4.2.2.3 No Action Alternative

Implementation of this alternative would not result in any loss of wildlife habitat.

4.2.3 Fish

4.2.3.1 Impacts Common to all Alternatives

The implementation of the proposed action, alternatives 1 and the no action alternative would have no impact on fish habitat. The proposed route for the transmission line is along ridge tops. No streams would be crossed.

4.2.4 Threatened or Endangered Species

No known threatened or endangered species inhabit the area and would, therefore, not be impacted by the selection of any alternatives being considered.

4.3 Cultural and Historic Resources

There would likely be no impact to cultural or historical resources from implementation of any of the alternatives. The entire Brigadier Road corridor between Pole Hill and Hill 3265 has been surveyed with no resources found that are eligible for listing on the National Historic Register. In the event any signs of cultural or historic resources were encountered during construction, all activities would cease until a professional archeologist evaluated the finding. Alaska State Historic Preservation Office and appropriate base authorities would also be contacted.

4.4 Recreational Resources

Implementation of the proposed action, alternative 1, and the no action alternative would likely have no effect on recreational resources. As stated in Section 4.2.2, the project is likely to result in some improved wildlife (browse) habitat and could enhance the opportunity for recreational hunters in the area.

4.5 Socioeconomic Factors

The project area is unpopulated with the nearest residential area located 14 miles away. Additionally, the socioeconomic impacts that might occur as a result of construction of the proposed power system from Pole Hill to Hill 3265 is inconsequential relative to the economic benefit impact in terms of Eielson and Fort Wainwright operations.

4.6 Environmental Justice

4.6.1 Environmental justice, as it pertains to the NEPA process, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. To accomplish these requirements the Air Force must conduct an environmental justice analysis of all potential impacts that may result from the proposed actions.

4.6.2 The site of the proposed project is located on federal lands designated for military operations. The closest residential area to this site other than Eielson housing is the community of Moose Creek located approximately 14 miles to the northwest. This residential area does not exhibit characteristics of low-income or minority populations that are not exhibited in the Fairbanks area population as a whole. Similarly, no native claims or allotments are located within a 10-mile radius of the project area. Based on the environmental impacts identified in this EA and on a corresponding environmental justice analysis, it is felt that no disproportionate impact to minority or low-income populations would occur from implementation of this project.

4.7 Cumulative Impacts

4.7.1 Cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Individual actions may result in minor impacts but collectively may result in significant actions taking place over a period of time.

4.7.2 Cumulative impacts associated with the construction and expansion of facilities have been addressed in several previous environmental documents. These documents include *Alaska Military Operations Areas-EIS* (U.S. Air Force 1995), *Alaska Army Lands Withdrawal Renewal-Final Legislative EIS, U.S. Army 1998, Fort Wainwright Resource Management Plan and Final EIS, U.S.D.I., Bureau of Land Management, 1989 and Integrated Natural Resources Management Plan 1998-2002 U.S. Army Alaska Volume 3, and Integrated Natural Resources Management Plan, Eielson Air Force Base, 1998.*

4.7.3 The Bureau of Land Management has been designated by Congress to be co-land managers with the U.S. Army for lands withdrawn under the Military Lands Withdraw Act of 1986, which includes the YTA. They have the responsibility of monitoring and documenting land use effects on these lands and to develop Resource Management Plans (RMP). The 1989 RMP for Fort Wainwright and the 1998 RMP for Eielson provide comprehensive discussions of cumulative impacts. These discussions arrive at the conclusion that significant cumulative impacts from military activities have not occurred.

4.7.4 The proposed action would result in impacts to vegetation along 25.7 miles of power line right-of-way. Previous road construction and maintenance activities by the USARAK and Eielson has resulted in several hundred acres of impacts to various types of habitats. However, when considered on a regional basis, Air Force activities in the Yukon Training Area have resulted in highly localized and cumulatively insignificant impacts. Relative to the total acreage that comprises the YTA (260,000 acres), the total number of acres that have been impacted by the Air Force for range related activities is estimated to be approximately 325 acres. Most of this acreage will, once Air Force activities are discontinued, revert back to relatively natural conditions. This will be achieved through a combination of active rehabilitation and natural revegetation of a given facility/site.

4.8 Unavoidable Adverse Impacts

The unavoidable impacts that might result from implementation of the proposed action would be a limited amount of clearing of vegetation along the power line corridor.

4.9 Relationship of Short-Term Uses and Long-Term Productivity

4.9.1 Proposed Action

The short-term uses and benefits with this alternative is that the Air Force would receive a reliable, economical, and maintainable power supply. Annual operating costs to operate the facilities served by the power and communication grid would decrease. Localized air quality in the vicinity of Pole Hill and Hill 3265 would increase. If the transmission line were no longer needed, the line could be removed and the area would eventually be restored to long-term productivity.

4.9.2 Alternative 1

The Air Force would upgrade the power source to Hill 3265 with a more economical system. Depending on the availability of wind resources, the burning of fossil fuels could be greatly reduced, which would result in a reduction of emissions. If the wind turbine was no longer deemed necessary, the components could be removed and the area could be restored and allowed to naturally revegetate.

4.9.3 No Action Alternative

The range would continue with its current power source and communication systems. There would be no loss of vegetation and no disruption to long-term productivity of resources.

4.10 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long-term. Irretrievable commitments are those that are lost for a period of time.
There are no irreversible commitments associated with the proposed action, alternative 1 or the no action alternative. No irretrievable commitments of resources would occur.

4.11 Mitigation

Design considerations that will reduce bird fatalities and best management practices during construction have been incorporated into the project design. Other than these measures, no specific mitigation is proposed or required.

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6.2 Glossary

Erosion – The wearing away of soil or organic matter by flowing water or wind.

Footprint – The maximum area required for the firing of weapons or detonation of munitions.

Loess – Unstratified deposits of silt and loam that are primarily deposited by the wind.

Mitigate – To reduce or negate the effects of an environmental disturbance.

Permafrost – Permanently frozen subsoil.

Physiographic – A region containing the same general natural characteristics.

Recharge – Surface water which percolates through porous soils to become part of the groundwater.

Upland – The higher parts of a region or tract of land.

Wetlands – Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soils conditions.