3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

A general overview of the existing physical and biological environment is presented and is based on the more detailed discussion of the existing conditions at Fort Richardson found in the Integrated Natural Resources Management Plan (INRMP) 2002-2006, U.S. Army Garrison, Alaska, Volume 3 Fort Richardson.

This section also discloses the environmental effects for the proposed action and alternatives. The following resource categories have different impacts depending on alternative. Those alternatives with unique impacts are discussed separately. In instances where resource categories have impacts that are common among all action alternatives, the discussion is combined. Mitigation for the proposed action is also included in this section.

3.1 Air Quality

3.1.1 Affected Environment

Fort Richardson is classified as a Prevention of Significant Deterioration major installation as defined in 18 AAC 50.300 (c) (1) because it has the potential to emit > 250 tons per year (TPY) of a regulated air contaminant in an area classified as attainment or unclassifiable. Fort Richardson is classified as a minor source of hazardous air pollutants (HAP) because the installation does not exceed the emission threshold for an individual HAP of 10 TPY or a combination of HAPs of 25 TPY. Fort Richardson must comply with the permit conditions outlined in Air Quality Operating Permit #237TVP01 issued November 28, 2003.

Fort Richardson is located within an area that is in attainment with the National Ambient Air Quality Standards (NAAQS) for all criteria air pollutants. NAAQS were developed as part of the Clean Air Act. The NAAQS are health-based standards established by the U.S. Environmental Protection Agency to protect human health and the environment. Major source thresholds will vary depending upon the local attainment status for a pollutant with an established NAAQS.

3.1.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. Air quality would not be adversely affected under the No Action Alternative.

3.1.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

All three alternatives under consideration are not located within a designated nonattainment area. The General Conformity Rule as described in 40 CFR Part 93, Subpart B does not apply, therefore, no conformity documentation will be required for any alternative being considered.

Impacts to air quality are confined to construction emissions generated from the equipment used to build the fence and the fugitive dust resulting from equipment operation. Table 2 lists estimated emissions from the operation of fencing-related construction equipment. Air emissions

resulting from the operation of the construction equipment would generate fugitive dust emissions from soil agitation and byproducts from the combustion of fossil fuels. The emissions during construction are expected to be minor and temporary in nature due to the methods proposed to mitigate fugitive dust generation.

Table 2. Summary of Emissions Associated with Construction Equipment Operation

Installation Fencing, Fort Richardson Construction Equipment Description	**NOx lbs/Hr**	**CO lbs/Hr**	**VOC lbs/Hr**	**No. of Units**	**Hrs Per Wk**	**No. of Wks/ Yr**	**NOx TPY**	**CO TPY**	**VOC TPY**
Concrete Truck - Gas	0.011	0.57	0.025	1	10	30	0.00	0.09	0.00
Medium-sized Tracked Bulldozer-Gas	0.011	0.57	0.025	1	25	30	0.00	0.21	0.01
Excavators - Gas	0.011	0.57	0.025	1	25	30	0.00	0.21	0.01
Truck-mounted Auger - Gas	0.011	0.57	0.025	1	20	30	0.00	0.17	0.01
Truck-mounted Pile Driver - Gas	0.011	0.57	0.025	1	20	30	0.00	0.17	0.01
Brush Chipper - Gas	0.011	0.57	0.025	1	10	30	0.00	0.09	0.00
Air Compressor - Diesel	0.018	0.011	0.002	1	20	30	0.01	0.00	0.00
Generator - Diesel	0.018	0.011	0.002	1	20	30	0.01	0.00	0.00
Water Truck - Gas	0.011	0.57	0.025	1	5	30	0.00	0.04	0.00
Dump Truck (8 CY Capacity) - Gas	0.004	0.83	0.043	2	15	30	0.00	0.37	0.02
Chain Saws - Gas	0.002	2.15	0.684	2	10	30	0.00	0.65	0.21
Pick-up/Small Utility Trucks	6.49	10.31	2.1	2	20	30	3.89	6.19	1.26
Welders < 50HP - Gas	0.002	1.479	0.054	2	25	30	0.00	1.11	0.04
Suction Pumps - Gas	0.002	1.479	0.054	2	15	30	0.00	0.67	0.02
Total Tons Per Year							**3.93**	**3.93**	**1.59**

3.1.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- Excavations, embankments, stockpiles, haul roads, permanent and temporary access roads, and all other project activities in or outside the project boundaries would be maintained to ensure they are kept free from fugitive dust.
- The application of water to the soil would control nuisance dust and minimize air quality impacts.

3.2 Soils and Vegetation

3.2.1 Soils

3.2.1.1 Affected Environment

The proposed fence project will encounter several different soil types along the Fort Richardson installation boundary and the cantonment area. Fort Richardson straddles both the alluvial fan of the Anchorage coastal plain and the moraine and glacial alluvium complex near the shore of Knik Arm. The gravel alluvium of the Anchorage coastal plain underlies the cantonment area. Overall, Fort Richardson's soils are shallow, immature, and deficient in the primary plant nutrients, especially nitrogen and phosphorous. In addition, they often exhibit low water retention capability, making them a primary limiting factor for vegetative growth during dry periods. In depressions and saturated areas, such as wetlands, surface horizons may be covered with partially decomposed herbaceous vegetation called peat.

3.2.1.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. The conditions are expected to remain the same under the No Action Alternative.

3.2.1.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

A 30-foot construction corridor on military property would be created along the proposed installation fencing. Construction equipment would include powered vehicles that would be driven along the fence corridor during initial construction. A rubber tire-mounted hydro-axe and a feller buncher would be needed to cut and remove the trees in the corridor. Several pick-ups and larger sized trucks would be needed to haul supplies and equipment and to provide the manpower to construct the fence. These vehicles would compact soils along this path, which may lead to reduced water absorption during storm events. Water runoff could lead to increased erosion in areas with exposed soils and sediment delivery to nearby waterways. Surface soils would also be disrupted when dozers grub tree roots. Actual fence placement would have minimal impact to soils since fence posts would be pile-driven into the ground.

Most areas where the fencing would be installed are flat or near level terrain. Erosion would not be a concern in these areas. One area has steeper slopes (from 5% to 20%) that must be revegetated immediately after the fence is installed. This area is the southern boundary area along the North Fork of Campbell Creek.

The proposed mitigation under each alternative for the protection of soil resources provides direction for clean-up if contaminated soils or material are discovered. In addition, storm water pollution prevention plans and best management practices would be implemented to stabilize exposed soils and manage storm water runoff along the construction corridor. Impacts to soils are expected to be minor.

3.2.1.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- Established USAG-AK and Alaska Department of Environmental Conservation procedures would be followed if contaminated soils or materials are discovered during construction.
- Exposed soils would be stabilized and storm water would be managed in a manner conforming to the existing Fort Richardson Storm Water Pollution Prevention Plan. In addition, the project contractor would be required to prepare a site-specific storm water pollution prevention plan and implement best management practices to stabilize exposed soils and manage storm water runoff.
- Berming or removal of surface soils during vegetation clearing or grubbing operations would be avoided to improve natural revegetation.

3.2.2 Vegetation

3.2.2.1 Affected Environment

The vegetation on the coastal plain where the proposed fencing would be installed is primarily a lowland interior forest of mixed spruce and hardwoods commonly referred to as boreal forest. Trees include white and black spruce, birch, aspen, and balsam popular. Common woody shrubs include Scouler and Bebb willow, Sitka and thin leaf alder, and resin birch. Other shrubs include prickly rose, devil's club, American red currant, bearberry, buffaloberry, bog blueberry, crowberry, high bush cranberry, low bush cranberry, raspberry, Labrador tea, rusty menziesia, and bush cinquefoil. Herbaceous plants include giant reed grass, A*rctagrostis*, fescue, sedges, twinflower, and lupine. Numerous species of mosses, lichens, and hepatics are also present.

Specifically, the 30-foot construction corridor along the proposed fencing route contains numerous vegetation types including white spruce-paper birch forest, birch forest, white spruce forest, black cottonwood and white spruce-black cottonwood forest, quaking aspen forest, balsam poplar forest, alder shrub, black spruce forest, black spruce woodland, sweetgale-ericaceous shrub, bluejoint grass-forb meadow, and artificially cleared sites with a heterogeneous mix of native and introduced plants.

The total length of the proposed fencing under each alternative is 32.6 miles. Approximately 11.2 miles of that area has been previously disturbed. The remaining length (21.4 miles) is undisturbed vegetation. In total, approximately 78 acres of undisturbed vegetation would be impacted along the 30-foot corridor of the proposed fence under Alternatives 2, 3, and 4.

3.2.2.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. Vegetation is expected to remain the same under the No Action Alternative.

3.2.2.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

Approximately 78 acres, or 21.4 miles of the total 32.6 miles of fencing, of undisturbed vegetation would be impacted along the 30-foot corridor of the proposed fence under Alternatives 2, 3, and 4. Fort Richardson encompasses 61,376 acres. The total amount of undisturbed vegetation that would be affected by the proposed action as compared to the total size of Fort Richardson is 0.13%. Comparatively, the amount of vegetation removed would be

minor under each alternative. Natural and planned revegetation would also reduce the impacts to vegetation.

The vegetation types along the proposed fence corridor would change from existing conditions. Any woodlands or shrub-dominated areas would be cleared to ground level, in an approximately 30-foot-wide corridor (on the military side of the fence), and be converted over time to an herb/grass plant community. Avoiding berming or removal of surface soils during the vegetation clearing or grubbing operations would improve revegetation. With native soils left in place, revegetation of natural herbaceous and deciduous plants would more readily occur. Vegetation along the fence line would be maintained at an herb/grass stage. Shrub growth would be inhibited for security and wildland fire safety purposes. The impact to the natural setting would be relatively short-term due to the fast recovering vegetation.

The steep area along the southern boundary near the North Fork of Campbell Creek should be revegetated immediately after the installation of the proposed fencing. A mix of Alaskan ryegrass and fescue should be used to revegetate the area after the fence has been installed. In addition, vegetation would be managed to prevent the establishment of invasive plant species and to maintain a low vegetative cover.

A strip of natural riparian vegetation would be left intact along the banks of waterways. Vegetation within the 30-foot wide corridor would not be cleared to the edge of the waterway in order to maintain existing cover and foraging areas for aquatic species. Protection of the riparian vegetation would also reduce erosion and downstream siltation.

Forest management along the proposed fencing corridor at Fort Richardson could include timber, fuelwood, or Christmas tree sales. A majority of the timber resources affected by the proposed action are owned by the Bureau of Land Management (BLM). The BLM requires the salvage of usable material. The potential exists for a one-time timber sale conducted on the proposed site to clear timber for fence construction. However, the availability of markets in Anchorage makes this type of removal impracticable. Instead, usable material would be placed in established firewood cutting areas at Fort Richardson and would be offered to firewood permit holders. This would prevent waste of salvageable timber. Any timber owned by USAG-AK and removed by construction contractors would be salvaged in a similar manner.

Overall, impacts to vegetation are expected to be minor.

3.2.2.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- A strip of natural riparian vegetation would be left intact along the banks of waterways (i.e. vegetation in the 30-foot-wide corridor would not be cleared to the edge of the waterway) to mitigate for potential loss of cover and forage area as well as for increased chances of erosion and downstream siltation.
- Within the 30-foot corridor, vegetation would be managed to prevent the establishment of invasive plant species and to maintain a low vegetative cover.

- Harvestable timber would be stockpiled. If any harvesting would occur, it would be coordinated with USAG-AK installation forester. Timber that is stockpiled during construction would also be coordinated through the installation forester.
- Existing large white spruce and paper birch would be used in the landscape design if possible.

3.3 Water Resources and Wetlands

3.3.1 Water Resources

3.3.1.1 Affected Environment

Fort Richardson surface water resources are diverse and include numerous streams, lakes, ponds, and a saltwater tidal bay. Fort Richardson surface water resources include the following: Eagle River; Clunie, Otter, Ship, Showhawk, Chester, and North Fork Campbell creeks; and Clunie, Gwen, Thompson, Otter and Walden lakes. Additional lakes and ponds include: Chain, Webb, Dishno, and Diablo ponds; and Kiowa, Cochise, and Snowhawk lakes. The quality of surface water at Fort Richardson has remained in neutral condition as shown in several sampling efforts conducted in 1995 (USAG-AK 2004).

The installation boundary crosses Eagle River, Ship Creek, Chester Creek, and the North Fork of Campbell Creek. The proposed installation fencing would terminate on either side of these waterways. The shoreline of Clunie Lake, located in the northern section of Fort Richardson, would not be followed by the proposed fencing. Fencing would terminate at both the northern and southern lake margins (see Figures 5, 6, 7 and 8).

3.3.1.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. Water resources would not be affected under the No Action Alternative.

3.3.1.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

There would be minimal sediment contributions to the rivers and streams adjacent to the proposed fencing. The proposed fencing would terminate 5 feet outside the high watermark near waterways that cross the installation boundary. In addition, construction of the proposed fencing in wet areas would occur only during the winter when the ground is frozen. Disruption to the surface soil would be minimal since fence posts would be put in place by pounding. Any sediment released from the creation of the 30-foot-wide corridor, or placement of fence posts and concrete footers at gates and corners, would be mitigated through compliance with the Fort Richardson Storm Water Pollution Prevention Plan and the site-specific storm water pollution prevention plan prepared by the project contractor. If erosion would occur due to construction or maintenance activity, further mitigation including check dams and silt fences may be used. Overall impacts to water resources would be minor.

3.3.1.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- Seedings, hay bails, siltation fence techniques and other appropriate engineering controls during and following construction would be used to stabilize exposed soils and control storm water runoff.
- Storm water would be managed in a manner conforming to the existing Fort Richardson Storm Water Pollution Prevention Plan. In addition, the project contractor would be required to prepare a site-specific storm water pollution prevention plan to manage storm water runoff.

3.3.2 Floodplains

3.3.2.1 Affected Environment

Compliance with Executive Order 11988, *Floodplain Management* states that structures should not adversely impede or channelize stream flow. Parts of the proposed fencing project would penetrate the floodplains of Eagle River, Ship Creek, and the North Fork of Campbell Creek. This executive order also requires federal agencies to consider all practicable alternatives to constructing within a floodplain. Complete avoidance of the floodplain is not possible. Because the purpose of the fencing is to enclose the installation at its boundary, and floodplains exist at various locations along the boundary of the installation, there exists no practicable alternative that will satisfy the purpose and need of the action.

3.3.2.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. Floodplains would not be further affected under the No Action Alternative.

3.3.2.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing

The proposed pipe-rail fencing along Eagle River, Ship Creek, and the North Fork of Campbell Creek floodplains would not adversely impede or channelize stream flows because the proposed fencing would be located five feet outside the high-water mark. In addition, the open pipe rail design would minimize the accumulation of debris during flood events, thus eliminating the potential for increase of flooding upstream.

The proposed chain link fencing along the Ship Creek floodplain on the southern portion of the cantonment area could impede and channelize stream flows given a large hydrological event. The relatively small mesh of the proposed chain link fencing design would have the tendency to collect large amounts of debris on the upcurrent side of the fence. This potential blockage would prevent the natural, free flow of water and could cause ponding or flooding in areas not previously affected during flood events. To minimize the potential for flooding, the Federal Emergency Management Agency (FEMA) has provided recommendations for fence design and placement. These and other measures designed to mitigate the potential impact will be incorporated into the project. As a result, Alternative 2 will have only a minor impact to floodplains near area streams.

3.3.2.4 Environmental Consequences of Alternative 3: High Security Fencing and Alternative 4: Setback Fencing

The proposed fencing along Eagle River, Ship Creek, and the North Fork of Campbell Creek floodplains could impede and channelize stream flows given a large hydrological event. The relatively small mesh of the proposed chain link and combination fencing designs would have the tendency to collect large amounts of debris on the upcurrent side of the fence. This potential blockage would prevent the natural, free flow of water and could cause ponding or flooding in areas not previously affected during flood events. To minimize the potential for flooding, the Federal Emergency Management Agency (FEMA) has provided recommendations for fence design and placement. These and other measures designed to mitigate the potential impact will be incorporated into the project. As a result, Alternative 3 and 4 will have only a minor impact to floodplains near area streams.

3.3.2.5 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to alternatives 2, 3, and 4.

- The proposed fencing would be placed five feet outside the high-water mark to mitigate for potential flood hazards.
- Where necessary, the fence would be designed and installed according to FEMA guidance.

3.3.3 Wetlands

3.3.3.1 Affected Environment

Areas of Fort Richardson contain freshwater and saltwater marshes, bogs, lakes and lake margins, and riparian areas. The post has estuarine, palustrine, riverine, marine, and lacustrine wetlands. Wetlands are most commonly found in the alluvial valley floors that are underlain by permafrost.

Wetlands do occur in places along the boundary where the proposed fencing would be installed. Fort Richardson has a total of 6,110 acres of wetlands (U.S. Army Corps of Engineers 1999). Less than 6 acres of wetlands would be impacted by the proposed fencing and the associated corridor. While the fence would extend into wetlands, installation of the fence would not result in a net loss of wetlands.

Executive Order 11990 obligates federal agencies to avoid construction within wetlands, unless no practicable alternative exists to building within a wetland. Complete avoidance of wetlands is not possible. Wetlands are found at various locations along the installation boundary. Because the purpose of the fencing is to enclose the installation at its boundary, there exists no practicable alternative that will satisfy the purpose and need of the action.

3.3.3.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, no new fencing would be installed at Fort Richardson. Wetlands would not be further affected under the No Action Alternative.

3.3.3.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing
The proposed fencing route would pass through wetlands. The U.S. Army Corps of Engineers Regulatory Branch will be consulted on requirements for a Clean Water Act Section 404 permit. Construction would follow terms set by Section 404 permits.

Initial construction activity would result in temporary disturbances to areas considered to be wet. To avoid substantial impacts to wetlands, the proposed fencing would be installed during the winter when the ground is frozen. Frozen ground and water bodies would support construction equipment needed to install the fence. This would prevent rutting and destruction of vegetation.

Most galvanized pipe would be pile driven into wetland areas. Chances of rutting and changes in hydrology in the wetlands would be greatly reduced during winter installation. However, some fence posts or gate footers will require mechanical drilling and cement footings. The U.S. Army Corps of Engineers will be consulted to determine whether a Clean Water Act Section 404 permit will be needed for these activities, and Fort Richardson would abide by all conditions set by the Corps for such permit.

Mechanical clearing of the proposed fencing corridor would also occur during the winter months to reduce wetland impacts. Vegetation would be hydroaxed when sufficient snow cover (a minimum of six inches) and frozen ground (a minimum of 12 inches) exists to prevent mechanical disturbance in wetland areas. Under Alternative 2 and 3, the approximate 30-foot-wide corridor would impact less than 6 acres of wetlands, on Fort Richardson. Under Alternative 4, impacts to wetlands would be greater where new fences would be built behind existing fences, thus affecting more acres. Alternative 4 would result in impacts to approximately 9.1 acres of wetland at Fort Richardson. Even though minor disturbances to wetlands may occur under all alternatives, there will be no net loss of wetlands from construction of a fence. Thus, overall, impacts to wetlands as a result of the proposed action would be minor.

3.3.3.4 Mitigation
Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- All construction activities in wetlands, including those that surround Chester Creek near the Muldoon Subdivision, would be conducted during winter months to prevent damage to wetlands.
- Hydro axing would be completed during the winter months when sufficient snow cover (a minimum of six inches) and frozen ground (a minimum of 12 inches) exists to prevent mechanical disturbance in wetland areas.
- Fort Richardson officials will consult with the U.S. Army Corps of Engineers to determine if project activities will require Clean Water Act (CWA) Section 404 permit and abide by all conditions set by the Corps for such permit.

3.4 Fisheries

3.4.1 Affected Environment

Fort Richardson has a diversity of surface water resources including numerous streams, lakes, and ponds. Four of the post's 12 named lakes and ponds are currently stocked annually and managed for sport fishing: Clunie, Otter, Walden and Gwen. The post also has four anadromous waterways: Ship Creek, North Fork Campbell Creek, Chester Creek, and Eagle River. These waterways collectively support all five species of Pacific salmon as well as Dolly Varden, grayling and rainbow trout/steelhead. The considered alternatives could impact all four anadromous waterways as well as Clunie Lake.

3.4.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fencing project. Therefore no detrimental impact to post fisheries would occur.

3.4.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing

Minor impacts to fish species within the anadromous streams on post would be expected under this alternative. The proposed fencing would terminate on either side of waterways that cross the installation boundary. The proposed fence would be placed five feet outside of the high water mark to prevent the creation of barriers, which could impede fish movement or access to habitat. Removal of vegetation adjacent to the banks of the waterways for the creation of the 30-foot-wide corridor would slightly decrease the amount of cover and foraging areas available to local fish and may contribute to localized erosion and downstream siltation. However, a strip of natural riparian vegetation would be left intact directly along the banks of waterways to mitigate for potential loss of cover and foraging areas.

Construction related impacts would be minimal through compliance with the Storm Water Pollution Prevention Plan. Minimal soil disturbance is expected for this project because construction of the proposed fencing would occur in winter months when soils and water bodies are frozen.

There would be no detrimental impact to the Clunie Lake fishery due to the fact the fencing would not be placed along the lake boundary.

3.4.4 Environmental Consequences of Alternative 3: High Security Fencing and Alternative 4: Setback Fencing

Overall, both alternatives would pose minor impacts to fish species within the anadromous streams at Fort Richardson. The proposed fencing would terminate on either side of waterways that cross the installation boundary. During flooding events where the water surpasses five feet outside of the high water mark, the relatively small mesh of the proposed chain link and combination fencing designs could form a barrier to fish movement along the edge of the waterway. These fence designs have the tendency to collect large amounts of debris on the upcurrent side of the fence. Migrating fish would be forced to negotiate the fence and collected debris and could become entangled.

Additionally, removal of vegetation adjacent to the banks of the waterways for the creation of the 30-foot-wide corridor would slightly decrease the amount of cover and forage area available to local fish and may contribute to localized erosion and downstream siltation. However, a strip of natural riparian vegetation would be left intact directly along the banks of waterways to mitigate for potential loss of cover and forage area.

Construction related impacts would be minimal through compliance with the Storm Water Pollution Prevention Plan and minimal soil disturbance is expected for this project because construction of the proposed fencing would occur in winter months when soils and water bodies are frozen.

There would be no detrimental impact to the Clunie Lake fishery due to the fact the fencing would not be placed along the lake boundary.

3.4.5 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- The proposed fencing would be placed five feet outside of the high water mark to mitigate for creation of barrier that could impede fish movement.
- A strip of natural riparian vegetation would be left intact along the banks of waterways (i.e. vegetation in the 30-foot-wide corridor would not be cleared to the edge of the waterway) to mitigate for potential loss of cover and forage area as well as for increased chances of erosion and downstream siltation.
- Any crossing of anadromous waterways with construction equipment would be done when the waterway is frozen.
- If required, a Fish Habitat Permit from the Alaska Department of Natural Resources, Office of Habitat and Permitting would be obtained prior to initiation of the proposed action.

3.5 Wildlife

3.5.1 Affected Environment

3.5.1.1 Large and Small Mammals

Moose are the featured species for wildlife management at Fort Richardson. They are the largest, most dominant, and the most sought-after of the large mammals for hunting and watchable wildlife. The primary source of information for moose management at Fort Richardson is based on data from aerial surveys collected (annually in November) cooperatively by USAG-AK and the Alaska Department of Fish and Game (Quirk 2003a). The survey area consists of 90,000 acres and includes both military installations (Fort Richardson and Elmendorf Air Force Base) and the Ship Creek Valley in Chugach State Park. Additional surveys are flown through the winter months to locate spatial and temporal moose concentrations and to determine the migration status of moose in the upper Ship Creek Valley and on the Chugach Mountain slopes.

The Army's Environmental Resources Department and Alaska Department of Fish and Game have the responsibility for managing the Fort Richardson Moose Herd. Over the past 25 years,

the Army has focused on habitat development and enhancement, conducting annual moose surveys, and directing the annual moose harvest.

Over the past 18 years, the population in the Fort Richardson Herd has remained relatively stable with a projected population of 517 animals. The Calf: Cow ratio during this period (1986-2003) is 37 calves per 100 cows (Quirk 2003a). This is somewhat higher than that of a typical moose herd in Alaska. The Bull: Cow ratio during this same time period is 50 bulls per 100 cows. This is a larger percentage than any moose herd in Alaska due to the desire to maintain a greater number of bulls in the herd for urban viewing and photography.

The Fort Richardson moose herd is adequately productive to allow an annual moose hunt by permit lottery. Up to 35 muzzle-loading rifle and 125 archery permits are issued annually. The early hunt begins the day after Labor Day (First Monday in September) and continues through November 15. The late or winter hunt begins December 15 and continues through January 15. The annual harvest of moose during the past five years has averaged 41 animals per year. The hunter harvest of moose along with natural and man caused mortality, (e.g., winter starvation, predation by wolves, natural injuries, highway accidents, etc.) account for approximately 10% to 15% of the moose herd annually (Quirk 2003a).

The Fort Richardson moose herd consists of a coastal plain population of animals on the military bases and a Chugach Mountain population in upper Ship Creek and on the western slopes of the mountains. The Chugach Mountain population is in its upland habitat in late spring, summer, fall, and early winter. When the snow pack in the mountains reaches a depth of approximately four feet, usually by late December, a mass migration of moose depart for the coastal plain on Fort Richardson. Limited winter habitat east of the Glenn Highway causes moose to migrate west across the Glenn Highway toward the Fort Richardson and Elmendorf Air Force Base cantonment areas and off of the South Post of Fort Richardson into Far North Bicentennial Park. From this area, the moose disperse into the Municipality of Anchorage (Quirk 2003a).

The annual moose survey is usually completed in November when the Chugach Mountain moose are in their upland habitat and can be easily distinguished from the coastal plain moose occupying the coastal plain on the military bases. In past years, the coastal plain population was larger than the Chugach Mountain population; however, in recent years (since 2000) the Chugach Mountain population has grown in numbers while the coastal plain population has declined. The Chugach Mountain population now represents the larger population of the two moose populations. In 2003, there was a projected moose population of 394 moose in the Chugach Mountain population and 257 animals in the coastal plain population for a total projected population of 651 moose in the Fort Richardson herd. The shift in numbers of Chugach Mountain and coastal plain moose is thought to be caused by coastal plain moose on the military bases joining the Chugach Mountain moose on their return to the mountain habitats. The shrinking population of the coastal plain moose on the military bases is primarily due to degrading and declining habitat on the coastal plain (Quirk 2003a).

Moose gates along the Glenn Highway were installed to provide moose that are trapped in the highway corridor a means with which to escape. The State of Alaska Department of Transportation initially included the gates as mitigation for a fencing project along the Glenn

Highway when it was installed in the early 1980s. A specially designed moose ramp under the Ship Creek Bridge on the Glenn Highway was also a mitigation measure for the Glenn Highway fencing. It was designed to provide moose and other animals with free passage and to allow annual moose migrations across the Glenn Highway. Additional lighting along the Glenn Highway in this area was also installed.

Small game and furbearers found on Fort Richardson include coyote, wolf, lynx, red squirrel, snowshoe hare, hoary marmot, marten, beaver, river otter, wolverine, red fox, porcupine, and mink. A current list of species within the Fort Richardson area can be found in Appendix F in the INRMP 2002-2006 (USAG-AK 2002).

The number of black and brown bears having home ranges or parts of their home range on Fort Richardson is estimated to be around 40 black bears and six brown bears. Intensive aerial surveys conducted on Fort Richardson in the summer and fall of 2003 substantiate the black bear numbers (Quirk 2003b). The Army's estimated black bear numbers are also closely correlated with Elmendorf's black bear studies that showed an estimated number of 38-50 black bears on the two military posts (Bostick 1997). Brown bear estimates are based on many years of personal observations from fixed-wing aircraft flights over Fort Richardson and by driving the many roads and trails on the installation during the summer and fall each year (Quirk, personal communication 2004).

3.5.1.2 Threatened or Endangered Species

There are no threatened or endangered species on any of the proposed alternative sites. Formal coordination with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act of 1973 was completed in 2002 (Appendix A). However, there have been confirmed sightings of several state and/or federal species of concern and sensitive species on the post (USARAK 2002).

Beluga whales have been observed each summer in Eagle Bay of Knik Arm of the Cook Inlet and the lower reaches of Eagle River on Fort Richardson (Quirk 2003c). The white whales appear to be feeding on salmon and other fish moving up to the head of Knik Arm to spawning streams. Harbor seals are sighted occasionally near the mouth of Eagle River.

Sightings of several avian species of concern and sensitive species have been reported at Fort Richardson (Andres et al. 1997). Trumpeter swans are fall and spring migrants through Eagle River Flats, and a pair has successfully nested for several years near Otter Lake. American ospreys are occasionally sighted on the post, although breeding sites are not confirmed. Olive-sided flycatchers are probable breeders on Fort Richardson but nest sites have not been confirmed. The blackpoll warbler is migrant and possibly breeds on the post. Although the primary habitat for the Townsend's warbler (mature white spruce forests) has been altered due to spruce bark beetle outbreaks, the species is a confirmed breeder on Fort Richardson (Andres et al. 1997).

The olive-sided flycatcher, gray-cheeked thrush (found on-site, but not a Priority Species in Region), Townsend's warbler, blackpoll warbler, American osprey, and American peregrine

falcon are sensitive species and species of concern, as identified by the State of Alaska, that are found at Fort Richardson.

3.5.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fencing project. Therefore, there would be no detrimental impact to wildlife. Animal movements would be expected to continue unimpeded under the No Action Alternative.

3.5.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing

This alternative allows for small, medium and large sized animal crossings at key wildlife areas that are known migration routes and corridors. Small and medium sized animal passage can easily be accommodated with a two-rail pipe fence design and gaps placed in fence will allow ease of passage for large animals. Fort Richardson will consult with Fish and Game officials to determine the best locations to place gaps in the pipe rail.

Impacts to wildlife are expected to be minor under this alternative. Existing fencing (including chain link, pipe rail, net wire, and combined security types) would remain in place under this alternative. In areas where the new pipe rail and chain link fence encounters existing fence, including the net wire fencing along the Glenn Highway, it would be placed at a given distance behind it.

The pipe rail fencing would not restrict movement of moose between Fort Richardson and State of Alaska lands east of the north post boundary. This area is the Fire Creek drainage and is approximately 5,000 acres of native forest. The fence design would resolve the major issues of concern with the proposed action by allowing large animal passage. During winter months, snowfall would accumulate and decrease the clearance between the ground surface and the bottom fence rail.

The proposed chain link fence to protect the Fort Richardson cantonment area would be constructed from the Ammunition Storage Point east to the Glenn Highway. In the winter, Chugach Mountain moose move down onto the Fort Richardson coastal plain on the east side of the Glenn Highway. After a period of time, a certain number of these moose move out of the Small Arms Range Complex by traveling west across the Glenn Highway. The moose would spend the remaining part of the winter in and around the two military cantonment areas of Fort Richardson and Elmendorf Air Force Base. The new security fence would divide the moose crossing area on the Glenn Highway approximately in half. Moose could cross the Glenn Highway between the Anchorage Regional Landfill and the National Guard's Camp Denali, (2.4 miles) and near the Fort Richardson Interchange (2.6 miles).

Wildlife movements across the Glenn Highway would not be restricted under this alternative. Gates would be installed along the Glenn Highway in locations matching the existing gaps (moose gates) in the net wire fencing to allow for wildlife movement. Road gates would also be installed within the chain link fencing on the northern portion of the cantonment area to provide wildlife passage to winter habitat area north of the Davis Highway on Fort Richardson North Post. Overall, impacts to wildlife are expected to be minor under this alternative.

3.5.4 Environmental Consequences of Alternative 3: High Security Fencing

The combination security fence would be installed at ground level within one foot of the installation boundary. This type of fencing would obstruct and prevent small, medium and large animal passage. The greatest impact to animal passage would occur in established migration areas. Moose and bears are the large animals that would be affected by installing the combination fencing along the installation boundary and the Glenn Highway Corridor.

Approximately 400 moose live in the Chugach Mountains east of Fort Richardson in the spring, summer, fall and early winter (Quirk 2003). Many of these moose migrate out of Ship Creek and from the Chugach Mountain slopes when the snow pack reaches 36-40 inches. This is usually by late December. These moose move down onto the coastal plain of Fort Richardson east of the Glenn Highway. After remaining on the coastal plain for a while, these moose further disperse across the Glenn Highway from the Small Arms Range Complex and into Far North Bicentennial Park from South Post. From the park, most of these moose move into various sections of the Municipality of Anchorage.

Obstruction of two major moose migration routes on Fort Richardson could confine and concentrate relatively large numbers of moose (up to 300) in areas with inadequate food sources during the winter and spring. The Chugach Mountain moose population could suffer a sharp and significant decline during severe winters. The physical condition of the animals would decline and the productivity of the herd would most likely plummet for several years until the population stabilized to the carrying capacity of the available habitat east of the Glenn Highway.

Prevention of normal migration could also result in higher densities of moose in developed urban areas where traffic and safety factors may be a concern. A decrease in moose numbers on Fort Richardson could also result in fewer permits issued for the annual moose hunt. Normal bear movement and migration along the forested coastal plain from Anchorage through Fort Richardson to Eagle River and vice versa would also be impeded by the combination security fencing.

Installation of the security fencing could affect winter training by concentrating moose on the Small Arms Complex and the Davis Range. Training facilities, such as the Infantry Squad Battle Course, Shoot House, and Breach Facility, were constructed on the Davis Range near Bunker Hill. At present, when training is conducted in these areas, moose readily disperse. Installation of the security fence may result in a more difficult dispersal of these animals. With high concentrations of moose around the ranges, problems and delays could frequently occur until the moose are moved out of the ranges. These delays and interruptions could substantially impact the training mission.

Small and medium-sized animals (i.e., wolves, coyotes, foxes, lynx, marmots, red and ground squirrels, mink, and weasels) would be trapped and unable to pass through the fence if the chain link mesh was installed at ground level. Obstruction of small and medium-sized animal movements could prevent normal and natural migrations needed for food resources, denning and rearing, and safe haven from predators. Predators could use the fence to trap large numbers of prey species and decimate wildlife populations. The fence would tend to segregate small and

medium-sized animal populations on both sides of the fence. Gene pools for the animals could be affected. Although some of the smaller mammals (i.e., mice, lemmings, voles, and shrews) may burrow under the fence, free and natural movement would tend to segregate the other small mammals on both sides of the fence. Medium-sized animals would be more adversely impacted. This would result in moderate to servere impacts to the animals.

Bears (both black and brown) could be adversely affected by the construction of a combination security fence through the interruption of normal movements and migrations patterns. However, in time, bears with their wide-ranging movement patterns would probably find a way around the fence.

3.5.5 Environmental Consequences of Alternative 4: Setback Fencing

Under this alternative, a pipe rail fence would be constructed within one foot of the installation boundary. In addition, an eight-foot chain link fence would be installed at ground level at an undetermined offset distance from the pipe rail fence. This type of fencing would obstruct and prevent small, medium and large animal passage in areas where no gaps are present. Fort Richardson would consult with state fish and game officials to determine the best locations to place gaps in the pipe rail and chain link fences to allow ease of passage for large animals.
Installing a pipe rail fence in areas where calves and cubs can go under the fence and adult moose and bears can go over the fence would resolve the major problems of how to allow large animal passage in the new fencing project. Small and medium-sized animals could also pass through the fence at the installed gap locations.

The environmental effects and impacts of implementing Alternative 4 would be the same as for Alternative 3 in those areas where no gaps are installed. In areas where gaps are installed, animal passage would continue; however, effects would be greater than Alternative 2. Overall, impacts to wildlife are expected to be moderate under this alternative.

3.5.6 Summary of Impacts to Moose Under Each Alternative

The proposed action, regardless of which alternative is chosen, may impact individual moose movement patterns in the Anchorage and Eagle River area. However, the proposed action is not expected to cause a significant adverse effect to the overall moose population of the area. Overall, moose are adaptive to changes in habitat as is evident by their survival and success within the urban fringe of the Municipality of Anchorage. USAG-AK proposes to closely monitor the Chugach Mountain and coastal plain moose populations as part of the Army's Ecosystem Management Program (initiated at Fort Richardson in 1999) under each alternative. Monitoring efforts would include the identification of preferred habitat, movement patterns, and population levels. If a change in the moose population is observed, adaptive management techniques, which are core to the Ecosystem Management process, would be applied. Examples of adaptive management may include improvements to habitat, installation of additional gates, modification of fence or gate design, or installation of additional lighting.

Existing wildlife movement mitigation methods along the Glenn Highway would continue to prevent adverse impacts to the moose population and moose/vehicle collisions. A change to existing gates, highway underpass, and lighting is not planned as part of the proposed action.

3.5.7 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to the indicated alternatives.

- Under Alternative 2 the pipe rail fence would include gaps located at various points to accommodate large mammals. Location of gaps will be determined in consultation with state Fish and Game officials and other stake holders.
- Under Alternative 2 gates would be installed within the chain link fencing along the northwest side of the Glenn Highway that correspond to existing gaps (moose gates) to allow for small, medium, and large animal passage. Additional gates would be installed in the chain link fence extending along the northern boundary of the Fort Richardson cantonment area.
- Under each alternative, the Chugach Mountain and coastal plain moose populations would be monitored as part of the Army's Ecosystem Management Program. After consultation with Fish and Game officials changes to the fence and/or adaptive management techniques would be applied when necessary to protect continued viability of the moose population.
- Under Alternative 4 gaps would be placed in the offset eight-foot chain link and pipe rail fencing at undetermined intervals to allow for small, medium, and large animal passage

3.6 Public Access and Recreation

3.6.1 Affected Environment

The U.S. Army in Alaska has a primary mission to maintain and enhance the combat readiness of its soldiers. However, within the military mission priority, USAG-AK recognizes the responsibility to allow public access to military lands, providing both civilians and military personnel with recreational opportunities. USAG-AK complies with the Sikes Act (Title 16, Chapter 5C, Subchapter 1, Section 670a, as amended in November 1997), which require that USAG-AK allow public access to the military installation to the extent that such use is consistent with the military mission and the protection of fish and wildlife resources. This access is still subject to requirements necessary to ensure safety and military security.

For training purposes, Fort Richardson is divided into sections called training areas. These training areas, which encompass the entirety of the recreational lands on Fort Richardson, may be individually closed to recreation during periods of active military use. This force protection policy is subject to change at any time, and under heightened security, access may be restricted.

Fort Richardson is a popular recreational destination for both military personnel and civilian residents of Anchorage and Eagle River. Recreational opportunities on post include: hunting, fishing, off-road recreational vehicle (ORRV) use, wildlife viewing, walking, jogging, skiing, snowshoeing, hiking, biking, berry picking, dog mushing, boating, picnicking, and camping (USAG-AK 2002).

Road access onto Fort Richardson is possible primarily from the Glenn Highway, at the main entrance or along Arctic Valley Road. The post is also accessible via Richardson Drive from Elmendorf Air Force Base. In addition, USAG-AK allows Eagle River rafting traffic to enter Fort Richardson. Paved and unimproved roads cover much of the northern and central portions of the post. Two ORRV access trails also exist on post, connecting green spaces near the cantonment area to more remote locations. Fort Richardson is also bounded by Chugach State Park and the Municipality of Anchorage's Far North Bicentennial Park, along its southern border. Trails exist connecting the post to the parks.

Currently, recreational users must call in to Range Control or the Provost Marshal Office (PMO) on Fort Richardson to obtain information on range closures. USAG-AK has implemented the USARTRAK system to facilitate access to military lands by allowing the recreational user to remotely check-in to the installation and training areas of choice. USARTRAK message systems are maintained by Range Control and have information on the latest Training Area closures.

Under the USAG-AK Access Policy at Fort Richardson, recreational users wanting access to South Post (areas south of the Glenn Highway), can enter military land without using the Main Gate, but must use the USARTRAK system. Recreational users wanting access on North Post (areas north of the Glenn Highway and within the cantonment area) must enter through the Main Gate in addition to using USARTRAK. Special Use Permits allow entry at points other than the Main Gate.

The public participates in numerous recreational activities that utilize trails accessing Fort Richardson from surrounding areas such as Muldoon, Stuckagain Heights and near Beach Lake. Several hiking trails enter the southern portion of Fort Richardson from Stuckagain Heights and link with popular trails in adjacent Chugach State Park and Far North Bicentennial Park (trails provide access to the Dome, Long Lake, and Kanchee, Knoya, Tikishla, Tanaina and Koktoyak peaks). Muldoon residents access Bulldog Trail as well as Chugach State Park and Far North Bicentennial Park from multiple sites along the Muldoon/Fort Richardson border. These sites include several public access points where Muldoon area streets dead-end at the boundary of Fort Richardson. The public has used these trails for 20 years or more.

Chugiak Dog Mushers have obtained a license from Fort Richardson to run their dogs on North Post since the early 1980s. Mushers have a parking and dog harnessing area on Beach Lake Road, a short distance from the Fort Richardson boundary. They utilize three points of access onto North Post near Beach Lake. These link a series of looped trails in the Beach/Psalm Lake areas with a series of looped trails on Fort Richardson.

Participants in two special annual events, the Mayor's Midnight Sun Marathon and the Iditarod Sled Dog Race, access the southern portion of Fort Richardson from Far North Bicentennial Park trails.

3.6.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fencing project. The public would be required to check-in using USARTRAK on Fort Richardson to obtain information on range closures.

3.6.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing

Fort Richardson has continuously provided recreational users access to the post through the Main Gate off the Glenn Highway. Overall, the new fencing would not alter authorized recreational opportunities accessed by the Main Gate.

However, this alternative poses minor impacts to traditional public access and recreation methods. For years, some individuals living near the installation boundary have, with relative ease, unknowingly or improperly entered the installation from nearby streets and adjacent subdivisions due to the lack of delineated installation boundary. The pipe rail design proposed under Alternative 2 would most effectively deter motorized vehicle access, and additional signs would warn against inadvertent trespass. However, under the USAG-AK Access Policy, individuals recreating on South Post (areas south of the Glenn Highway), would be able to enter military land without using the Main Gate but would be required to use the USARTRAK check-in system. Those individuals recreating on North Post (areas north of the Glenn Highway and within the cantonment area) would be required to enter through the Main Gate in addition to using the USARTRAK check-in system.

Any existing Special Use Permits that allow entry at points other than the Main Gate would remain in effect under the proposed action and access to Fort Richardson under the permit conditions would not change. To allow dog mushers to negotiate the proposed pipe rail fence on North Post, gaps with bollards would be installed at existing entry points for mushing along the northeastern boundary.

Gates would be installed in specific locations to allow access for the Mayor's Midnight Sun Marathon and the Iditarod Sled Dog Race. These events would not be adversely affected by the proposed action. Gates in the new fencing would be installed where trails utilized for these events enter or exit the post. Overall impact to authorized entry onto Fort Richardson would be minor.

3.6.4 Environmental Consequences of Alternative 3: High Security Fencing

Fort Richardson has continuously provided recreational users access to the post through the Main Gate off the Glenn Highway. Overall, the new fencing would not alter authorized recreational opportunities accessed by the Main Gate.

However, Alternative 3 poses moderate to severe impacts to unauthorized entry. Installation of a high security fence along the Fort Richardson boundary would deter unauthorized vehicle and pedestrian passage for most of its length and would limit traditional access to certain trails such as those in the Muldoon and Stuckagain Heights areas of South Post. Recreational users would be required to access Fort Richardson through the Main Gate. By doing do so, they would be

informed about which areas they may use and which are restricted for safety, security, and training mission requirements.

Muldoon and Stuckagain Heights residents could still access the local trail system but would have to hike around the terminal end of the fence, thereby increasing the distance of their hike. Under the USAG-AK Access Policy, the public would be required to utilize the USARTRAK system.

Any existing Special Use Permits that allow entry at points other than the Main Gate would remain in effect under the proposed action, and access to Fort Richardson under the permit conditions would not change. Dog mushers on North Post would most likely not be able to negotiate the proposed high security fence under Alternative 3. Gaps with bollards would be installed at existing entry points for mushing along the northeastern boundary.

Gates would be installed in specific locations to allow access for the Mayor's Midnight Sun Marathon and the Iditarod Sled Dog Race. These events would not be adversely affected by the proposed action. Gates in the new fencing would be installed where trails utilized for these events enter or exit the post. Overall impact to authorized entry onto Fort Richardson would be moderate.

3.6.5 Environmental Consequences of Alternative 4: Setback Fencing

Fort Richardson has continuously provided recreational users access to the post through the Main Gate off the Glenn Highway. Overall, the new fencing would not alter authorized recreational opportunities accessed by the Main Gate.

However, this alternative poses moderate impacts to unauthorized access and recreation. Installation of a pipe rail fence along the installation boundary and an additional chain link fence at a setback distance would deter both vehicle and pedestrian passage for most of its length. Vehicular access would be greatly limited under this alternative. Alternative 4 would also limit unauthorized access to certain trails such as those in the Muldoon and Stuckagain Heights areas of South Post. Pedestrian access would be impacted somewhat less as compared to Alternative 3 because gaps would be installed in the chain link fencing. Variable spacing would be based on terrain, movement patterns of wildlife, and proximity to military training resources. Muldoon and Stuckagain Heights residents could still access the local trail system but would have to hike to the nearest gap or would have to hike around the terminal end of the fence, thereby increasing the distance of their hike.

Under the USAG-AK Access Policy, the public would be required to utilize the USARTRAK system once implemented. Individuals recreating on South Post (areas south of the Glenn Highway), would be able to enter military land without using the Main Gate but would be required to use the USARTRAK check-in system. Those individuals recreating on North Post (areas north of the Glenn Highway and within the cantonment area), would be required to enter through the Main Gate.

Any existing Special Use Permits that allow entry at points other than the Main Gate would remain in effect under the proposed action, and access to Fort Richardson under the permit

conditions would not change. Dog mushers on North Post would most likely not be able to negotiate both types of fencing proposed under Alternative 4. Gaps with bollards would be installed at existing entry points for mushing along the northeastern boundary.

Gates would be installed in specific locations to allow access for the Mayor's Midnight Sun Marathon and the Iditarod Sled Dog Race. These events would not be adversely affected by the proposed action. Gates in the new fencing would be installed where trails utilized for these events enter or exit the post. Overall impact to authorized entry onto Fort Richardson would be minor.

3.6.6 Mitigation.

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- Under the USAG-AK Access Policy, recreational users would be required to obtain a Recreational Access Permit (RAP) from the MWR Office, Visitor Center, or Natural Resource Office to recreate on Fort Richardson. After obtaining a permit, users are required to use the U.S. Army Recreation Tracking System (USARTRAK) to recreate on Fort Richardson and to obtain information on range closures.
- Under the USAG-AK Access Policy, recreational activity on South Post (areas south of the Glenn Highway) would be accessible without using the Main Gate but use of the USARTRAK system would be required. However, for activity on North Post (areas north of the Glenn Highway and within the cantonment area) individuals would be required to enter through the Main Gate.
- The agreement between the Chugiak Dog Mushers Association and USAG-AK would be retained for the use, maintenance, and operation of trails which are located within the military installation boundary.
- Gates would be installed in specific locations to allow access for the Mayor's Midnight Sun Marathon and the Iditarod Sled Dog Race.
- Gaps with bollards would be installed at existing entry points for mushing along the northeastern boundary.

3.7 Infrastructure

3.7.1 Affected Environment

Utility lines including water, electric, sewer, and petroleum are located adjacent to the installation boundary on South Post and along the Glenn Highway.

There are segments of the installation boundary where the boundary markers cannot be located. In these areas, new surveys would be required to locate the boundary prior to installation of the fence. Areas requiring surveys are along the Glenn Highway right-of-way, the Alaska Native Heritage Center, Bartlett High School, and portions along the North Fork of Campbell Creek.

The Alaska railroad line crosses Fort Richardson as it heads north from Anchorage to Fairbanks. The railroad line intersects Fort Richardson's eastern boundary near Clunie Lake. Coordination between USAG-AK and the Alaska Railroad Corporation is on-going regarding use of a proposed right-of-way along the northern edge of the railroad line near Clunie Lake.

3.7.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fencing project. Therefore, there would be no impacts to existing infrastructure.

3.7.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

There is no building demolition associated with any of the proposed alternatives. The proposed action would encounter utilidors and water, electric, sewer, and petroleum lines. It will be necessary to conduct locates and obtain clearances from all utilities near the fencing project prior to construction. Impacts to these facilities would be minor.

Areas where boundary markers were not located would be surveyed prior to fencing installation.

Further negotiations regarding fence placement near the Alaska Railroad and the National Guard's Camp Denali would take place prior to fencing construction. Impacts to these facilities are anticipated to be minor.

3.7.4 Mitigation

No mitigation measures are proposed.

3.8 Fire Management

3.8.1 Affected Environment

Fire management on USAG-AK installations is required by the Sikes Act and by Army Regulation 200-3. Fire management plans are required by the Resource Management Plan, which is mandated under Public Law 106-65, the Military Lands Withdrawal Act. Additional direction regarding fire management is provided in a 1995 Memorandum of Understanding between the Bureau of Land Management (BLM) and USARAK; as well as in the Army wildland fire policy guidance document (Department of Army 2002).

Wildland fire management in Alaska requires multi-agency cooperation. Fire management is a joint effort between USAG-AK and the BLM, Alaska Fire Service. The agencies have developed two inter-service support agreements, which establish the Alaska Fire Service's responsibility for all fire detection and suppression on installation lands (Alaska Fire Service and USARAK 1995a,b). In exchange, the Army provides the Alaska Fire Service with use of certain buildings, utilities, land, training services, air support, and other support services.

The Alaska Fire Service also has a Reciprocal Fire Management Agreement with the State of Alaska's Department of Natural Resources, Division of Forestry (Alaska Fire Service and State of Alaska 1998). Under this agreement, the agencies have implemented a coordinated fire suppression effort and have identified areas where each agency has agreed to provide wildland fire suppression, regardless of whether the lands are under state or federal ownership.

The Alaska Wildland Fire Management Plan, which is reviewed each year, designated wildland fire management areas and allowed land managers to establish fire management options according to land use objectives and constraints. The Alaska Wildland Fire Management Plan also established four fire management options: Critical, Full, Modified, and Limited. Land managers may select among these options for different parcels of land, based on evaluation of legal mandates, policies, regulations, resource management objectives, and local conditions (Alaska Wildland Fire Coordinating Group 1998).

The North Post of Fort Richardson is classified for Full and Critical fire management options due the high value of resources at risk from fire, in addition to the post's proximity to Anchorage, Eagle River, and Elmendorf Air Force Base (Alaska Wildland Fire Coordinating Group 1998). Most of the North Post is classified for Critical fire management. The training areas along Knik Arm are classified for Full fire management. Many military resources at North Post are at risk from wildland fire. Cultural resources staff identified sites in the North Post area, but management options related to wildland fire have not been determined (USARAK 2002b).

The South Post has areas classified under Critical, Full, and Limited fire management. Most of the South Post is under Full fire management because the area is mainly used for military training and small arms ranges. The alpine zones are classified for Limited fire management because of their remote location. Many military resources are at risk from wildland fire in the training areas of the South Post, including two small arms complexes (USARAK 2002b).

Fire probably had a more important influence on ecosystem functions in the Anchorage area during presettlement times. Wildfires were found to be prevalent in the 1800s and early 1900s. Forty-eight percent of Fort Richardson over the past 200 years has been affected by fire (Jorgenson et al. 2002). This was indicated by the occurrence of early to mid-successional forest stages that have developed since the fires in the 1800s and early 1900s (Jorgenson et al. 2002). Although fires were relatively small and localized due to the weather and climate, settlement resulted in fire suppression and the development of road systems that further reduced natural fire frequency at Fort Richardson.

Although wildfires are a concern at Fort Richardson, they are rarely a significant problem. Numerous fires have been recorded in the Matanuska-Susitna Valley to the north, but no major fires have occurred on Fort Richardson since 1950 (Jorgenson et al. 2002). Severe drought conditions occur about once every 20 years, and, in normal years, there is an average of less than five wildfires. These fires are usually mission-related, small, and easily contained.

A fire history for the Fort Richardson Small Arms Training Complex was completed in 1998, providing a small glimpse into the fire history of Fort Richardson. From 1947-1997, 47 fires were reported. It should be noted that not all fires were reported and some records are missing. Of the 47 fires, 40 were attributed to training related starts and 14 were attributed to pyrotechnic rounds. Of these 14 fires, seven occurred in May, five in June, one in July, zero in August and September, and one in October. This pattern correlates with weather trends of the area. It is driest in early spring, and then rains come in July and August followed by another dry spell in the fall. Particularly noteworthy are the fires of May 1951. Tracer rounds ignited two fires that burned 1,000 acres (Claypool and Higgins 1998).

The Fort Richardson Fire Department provides the initial response for wildfire suppression, which has traditionally been confined to areas behind the small arms complex. Because of the extensive mortality of white spruce in the area, fire prevention activities were conducted in 1999 and 2000 to reduce fuel loads adjacent to the small arms ranges (USARAK 2002b).

When necessary, BLM reimburses the Alaska Division of Forestry to suppress wildfires at Fort Richardson. The Division of Forestry also provides training for wildfire suppression at Fort Richardson. USARAK and Elmendorf Air Force Base have a mutual aid agreement for fire suppression (USARAK 2002b).

3.8.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fence. Therefore, there would be no changes in current fire management techniques.

3.8.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

Fences limit firefighter access to fires and therefore limit the ability of wildland firefighters to suppress fires. By increasing the amount of fenced area on Fort Richardson firefighter access and techniques to suppress wildfires would also be limited. Each alternative poses a potential adverse impact to wildland fire management. Alternative 2 requires the least amount of fence and would have the smallest effect on wildland firefighter access. Alternative 4 proposes the installation of the greatest amount of fencing and would have the greatest effect on wildland firefighter access. However, under each alternative gates would be installed at both North and South Post to allow for access during wildfire events and other emergencies. The decision where to locate fire access fences will be made after consultation with Division of Forestry Matanuska-Susitna/Southwest Office and the Alaska Fire Service. Fire management activities would continue to be conducted according to existing agreements and plans. Adherence to proposed mitigation measures would result in minor impacts associated with the proposed action.

3.8.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- The Division of Forestry Matanuska-Susitna/Southwest Office would be given access onto military lands from different points along the boundary for initial attack and suppression of wildfires.
- Dimensions of gates would accommodate personnel as well as fire engines and larger equipment. The decision where to locate access gates will be made after consultation with the Division of Forestry Matanuska-Susitna/Southwest Office and the Alaska Fire Service
- A site visit would be coordinated with the Division of Forestry Matanuska-Susitna/Southwest Office and the Alaska Fire Service after fence placement to determine buffer zone maintenance methods. The buffer zone would be maintained (grass beds treated annually) to prevent regeneration of flammable, prolific invasive species and reduce human safety risks from fire danger in areas with a high human population.

3.9 Cultural Resources

3.9.1 Affected Environment

Cultural resources include features and objects dating to the prehistoric and historic periods that are found or are likely to be found as defined by the National Historic Preservation Act (NHPA) of 1966 (as amended). Cultural resources relating to the NHPA and the Native American Graves Protection and Reparation Act are considered in this analysis. Management of cultural resources on federal lands depends on eligibility of resources for inclusion in the National Register of Historic Places (NRHP).

Although cultural resources in all five NRHP categories potentially exist on Fort Richardson, only two districts and one site have been determined eligible, and are managed under the NHPA.

3.9.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, Fort Richardson would not construct the proposed fence. Therefore, there would be no impacts to cultural resources.

3.9.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

The primary impacts to cultural resources under the proposed action could involve, but are not limited to, ground disturbance at identified archaeological sites and visual impacts to historic buildings or districts.

Analysis of potential cultural resource impacts is based on the nature of proposed activities and their potential to affect cultural resources. The following categories are used in assessing potential impacts:

No Historic Properties Affected – Implies there are no known or expected historic properties in the area of potential effect of the undertaking.

No Historic Properties Adversely Affected – Implies that there are known historic properties in the project's area of potential effect but that the proposed undertaking does not impact the qualities of the historic property that makes it eligible for listing in the NRHP.

Historic Properties Adversely Affected – Implies that there are known historic properties in the project's area of potential effect and the proposed undertaking will have an impact on the qualities of the property that makes it eligible for listing in the NRHP.

Impacts to cultural resources under Alternatives 2, 3, and 4 would be minor. All three alternatives would include ground-disturbing activities associated with the installation of new fencing and the upgrade of existing fencing along the Fort Richardson boundary. There are no reported or suspected cultural resources in areas where the fencing is proposed. A determination of No Historic Properties Affected applies to each alternative. In addition, no visual impacts to cultural resources, including Site Summit, are expected to occur as a result of the proposed action. Consultation obligations under Section 106 of the National Historic Preservation Act have been met (Appendix B).

3.9.4 Mitigation

Mitigation measures have been proposed as part of the proposed action. The following measures are applicable to Alternatives 2, 3, and 4.

- If cultural resources are discovered during construction, mitigation measures, including halting excavation or associated construction activity pending notification to the USAG-AK Cultural Resources Manager would be implemented.

3.10 Environmental Justice

3.10.1 Affected Environment

In 1994, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This executive order directs each federal agency to identify and address any disproportionately high and adverse environmental effects of its programs, policies, and activities on minority populations and low-income populations. Environmental effects include effects on human health and safety, minority and low-income communities, and socioeconomics.

The Presidential Memorandum accompanying Executive Order 12898, sent to heads of departments and agencies, specifically recognizes that environmental justice concerns should be identified and addressed under the procedures required by NEPA. In addition, the Department of Defense Strategy on Environmental Justice requires implementation of Executive Order 12898, principally through compliance with the provisions of NEPA.

In addition, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires the identification and assessment of environmental health and safety risks that may disproportionately affect children.

The region of influence for the environmental justice analysis was established by determining the most geographically far-reaching effect and including the communities within that area in the analysis. Fort Richardson lies nine miles east of Alaska's largest city in the Municipality of Anchorage. The residential areas bordering Fort Richardson are the Anchorage subdivisions of Muldoon and Stuckagain Heights and to the north, portions of Eagle River and Eklutna.

3.10.2 Minority and Low-Income Communities

Statistics on ethnicity and poverty levels from the 2000 U.S. Census were compiled from the Alaska Department of Community and Economic Development. Minority populations are identified using U.S. Census Bureau data to delineate areas where the percentage of minority individuals exceeds the state average by 5%. Low-income communities are identified using the 2001 U.S. Department of Health and Human Services Poverty Guidelines for the state of Alaska. Communities where the percentage of households with incomes below the poverty level exceeded the percentage of low-income households statewide by 5% are defined as low-income communities.

Since the percentage of persons in Alaska identified as minority under U.S. Census guidelines is 30.7%, any community with a minority population of 35.7% or above is considered a minority community for purposes of this analysis. The same method is used to define low-income

communities: 11.2% of Alaskans are considered low-income, so any community where the percentage of persons living below the poverty level is 16.2% or higher is a low-income community for the purposes of this environmental justice analysis.

Based on U.S. Census statistics from 2000, Anchorage had a population of 260,283 persons. Of that total, 31.1% were minorities and 7.4% had incomes below poverty level. Eagle River and Eklutna, with a combined population of 29,896, had a minority population percentage of 16.3%. No low-income data exists for Eagle River alone during this census, but the community of Eklutna had a low-income percentage of 2.4% (USAG-AK 2003).

Environmental justice analysis seeks to ensure that minority and low-income communities do not bear a disproportionate share of negative environmental consequences resulting from federal agency activities. In particular, Executive Order 12898 directs agencies to pay special attention to subsistence issues when dealing with environmental justice, since these communities often rely heavily on hunting, fishing, and gathering for their primary dietary/nutritional needs. For this purpose, the Eklutna, Knik and Chickaloon tribes have been consulted in regard to any subsistence requirements that would be affected by the proposed project.

3.10.2.1 Environmental Consequences of Alternative 1: No Action (Existing Fence)
Under this alternative, USAG-AK would continue its current training uses of Fort Richardson without any disproportionate adverse effects on surrounding minority or low-income communities.

3.10.2.2 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing
The proposed action and its alternatives would be confined to military reservation lands but would be located in places adjacent to private property owners. The communities that would be directly impacted by the proposed action are the Muldoon area, Eagle River and Stuckagain Heights. These are primarily middle-income households, with an ethnic and cultural mix representative of the city and state populations. The proposed action will not disproportionately impact minority and low-income communities.

3.10.3 Protection of Children
Human health and safety includes the facets of military activities and materiel that potentially pose a risk to the health, safety and well being of military personnel or civilians. Risks include hazardous materials and wastes, in addition to unexploded ordnance and other occupational safety hazards posed by activities on USAG-AK lands.

Eagle River Flats Impact Area is surrounded by a 300-meter buffer zone. Both the impact area and its buffer zone are off-limits to unauthorized personnel. In addition, impact areas are posted with warning signs indicating the potential risks of unexploded ordnance on the impact area. The proposed installation fencing would provide an additional barrier against access to Eagle River Flats Impact Area, and would be beneficial to public health and safety.

3.10.3.1 Environmental Consequences of Alternative 1: No Action (Existing Fence)

Under this alternative, USAG-AK would continue its current training uses of Fort Richardson. The representative hazards to those who gain unauthorized access to training areas would remain unchanged.

3.10.3.2 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing, Alternative 3: High Security Fencing, and Alternative 4: Setback Fencing

According to the Task Force on Environmental Health Risks and Safety Risks to Children, four priority areas of concern regarding children's health and safety are: childhood asthma, unintentional injuries, developmental disorders, and childhood cancer. With these priorities in mind, potential effects on children from fence construction activities would be beneficial, instead of detrimental. Access would be restricted; therefore, unintentional injuries caused from children gaining unauthorized access to training lands during training activities would be reduced. Additionally, the decreased access would reduce the potential for exposure to contaminated sites, thus reducing the risk of developmental disorders or childhood cancer.

Sensitive areas for exposure to children are schools and family housing areas. Environmental health and safety risks are attributable to products that a child might come in contact with or ingest as well as safety around construction areas and fencing. Proposed projects are within the military reservation; construction and operation of these projects would comply with federal safety standards, and the installation of fencing would reduce unauthorized access to ranges, which could otherwise cause risks to children. Neither the proposed action nor its alternatives would have significant or disproportionate adverse effects on children or pose health or safety risks. Installing fencing with appropriate signage should have a beneficial impact on environmental health and safety for children by reducing intentional or inadvertent access to the military reservation.

3.10.3.3 Mitigation

No mitigation measures are proposed.

3.11 Socioeconomics

3.11.1 Affected Environment

Anchorage is the largest city in Alaska with a total population of 260,283 (certified December 2001, by the Alaska State Department of Community and Economic Development). This represents over 40% the population of the entire state. Fort Richardson and Elmendorf Air Force Base have played a pivotal role in the Anchorage economy for many years. Together, they represent the single largest economic engine in the area (USAG-AK 2003).

Anchorage has become the state's center of commerce. The banking, insurance, transportation, communications, real estate, tourism and other major industry (including oil and gas) headquarters are found in Anchorage. State government revenues have primarily relied upon the oil and gas industry, which financed over 80% of state budgets in the last quarter century.

Anchorage demographics are similar to the statewide averages. Table 3 illustrates the distribution of population by race. Anchorage has a lower proportion of Natives and higher

proportion of whites. Age distribution of the population shows figures more closely matching statewide averages. Although there are a larger proportion of males, it is not as large a differential as elsewhere in the state.

Table 3. Anchorage Region Population Profile for 2000

Population by Race	**Number**	**Percent**
Population in 2000	260,283	100
White	188,009	72.2
Alaska Native, or American Indian	18,941	7.3
Black or African American	15,199	5.8
Asian	14,433	5.5
Hawaiian Native	2,423	0.9
Other Race	5,703	2.2
Two or More Races	15,575	6.0
Hispanic Origin (Any Race)	14,799	5.7
Not Hispanic (Any Race)	245,484	94.3

Source: Alaska State Department of Community and Economic Development 2002.

Table 4 demonstrates Anchorage area's income and poverty statistics are significantly better than the statewide average. Anchorage median household income ($55,546) is slightly above the state ($43,657) and national ($37,005) average. Persons below poverty level in Anchorage (7.4%) are below the state (11.2%) and the national (13.3%) average (USAG-AK 2003).

Table 4. Anchorage Region Income and Poverty Statistics for 2000

Per Capita Income	$25,287
Median Household Income	$55,546
Median Family Income	$63,682
Persons in Poverty	18,682
Percent of Population Below Poverty Level	7.40%

Source: Alaska State Department of Community and Economic Development 2002

Table 5 lists average monthly employment by standard industrial classification in the Municipality of Anchorage. There are two important items to note. First, uniformed military is not included in the data provided by the Department of Labor and has been added at the bottom of the table for comparison. Uniformed military at Fort Richardson and Elmendorf Air Force Base adds about another 8,500 employees and comprises almost 24% of the total government work force. This brings total industry employment up to about 140,000 with total government contributing over 36,000 of that, or about 26%. This is a notably high degree of government employment.

The other item of note is the pay differential between private and public sectors. It runs opposite to the nationwide pattern. Uniformed military earnings are somewhat below the government average (Table 5). The average monthly earnings across all job classifications in the Anchorage

Municipality are $3,037. Average monthly earnings for personnel on Fort Richardson are $3,550, about 10% higher.

Table 5. Anchorage Region Average Monthly Employment and Earnings Statistics for 2000

Industrial Classification	**Average Monthly Employment**	**Average Monthly Earnings ($)**
Total		
Total All Industries	130,902	3,037
Private Ownership	103,247	2,867
Total Government	27,655	3,674
By Industry		
Agriculture, Forestry and Fishing	776	1,813
Mining	3,016	8,394
Construction	6,959	4,089
Manufacturing	2,234	2,949
Transportation, Communications and Utilities	15,225	3,813
Total Trade	31,248	1,985
Finance, Insurance and Real Estate	6,789	3,316
Services	36,949	2,478
Federal Government	9,914	4,264
State Government	8,744	3,161
Local Government	8,997	3,523
Uniformed Military	**8,503**	**3,552**

Source: Alaska Department of Labor and Workforce Development 2001; USARAK Public Affairs Office 1995-2002.

Economic activity attributable to Fort Richardson is presented in Table 6.

Table 6. Socioeconomic Impacts of Fort Richardson for 2000

Uniformed Personnel	2,045
Non-uniformed Personnel	1,261
Annual Total Payroll	$139,500,000
Non-personnel Expenditure	$138,300,000
Total Annual Employment Impact Including Multiplier	9,378
Total Annual Dollar Impact Including Multiplier	$550,000,000

Source: U.S. Army Alaska FY 2002 Demographics, provided by USARAK Public Affairs Office 1995-2002.

3.11.2 Environmental Consequences of Alternative 1: No Action (Existing Fence)

USAG-AK's activities on Fort Richardson would continue to contribute beneficial economic impacts to the Anchorage area under the No Action Alternative. Training and deployment activity would be expected to continue.

3.11.3 Environmental Consequences of Alternatives 2, 3 and 4

Each of the alternatives under consideration represents beneficial socioeconomic impacts to the Anchorage community. With each alternative, project construction will be undertaken by private companies, and material for the fencing will be obtained from the private sector. Regardless of the construction firm, selected the project represents additional consumption of goods and services provided by the local commercial sector. Each alternative represents a beneficial impact on the local economy.

3.12 Aesthetics

3.12.1 Affected Environment

The potential impact to the aesthetics of an area is also a consideration in determining the potential impact of a proposed federal project. An important element in the quality of life of Anchorage residents is the enjoyment derived from residing in close proximity of an exceptional natural environment. Currently, those residing along the Fort Richardson boundary in the Muldoon and Stuckagain Heights communities enjoy a relatively unobstructed view of the Chugach Mountains. Those within Eagle River enjoy views of undeveloped forests along the northeastern Fort Richardson boundary.

The proposed action will serve to alter the view of adjacent private property owners. The degree of impact will depend upon the type and proximity of the fence to the adjacent private property. Other factors affecting overall impact include existing privacy fences and structures on or near private property.

3.12.2 Environmental Consequences of the Alternative 1: No Action (Existing Fence)

The No Action Alternative would maintain the status quo. View of forested areas and neighboring mountain ranges would not be changed.

3.12.3 Environmental Consequences of Alternative 2: Pipe Rail and Full Cantonment Security Fencing

Alternative 2 has the potential to diminish the aesthetics of neighboring property. Aesthetics would be most impacted in areas where currently no fencing exists along the Fort Richardson boundary.

Within sections of the Eagle Glen and Muldoon subdivisions are spans of pipe rail fencing running along the Fort Richardson boundary (Figure 5). The design of the new pipe rail fencing to be installed in these areas under Alternative 2 would closely match the existing fencing (Figures 2 and 6). The existing pipe rail fencing in these areas consists of two galvanized steel pipes with the same approximate height as the proposed pipe rail fence. The proposed pipe rail fencing for Alternative 2 would be 40 inches high, with a lower pipe 22 inches above the ground surface. The new pipe rail fence will closely match that already existing on the Fort Richardson

boundary. From the perspective of neighboring private property, the pipe rail fencing will have minor impact on aesthetics.

The chain link security fence intended for the cantonment area represents a greater impact to aesthetics. Unlike the pipe rail fence, no private property borders the area of Fort Richardson where chain link fencing will be placed. While this portion of the fencing project would be visible to motorists driving the Glenn Highway, the new fencing would not substantial change the view from the highway, as it is already impeded by a wire-mesh fence moose fence installed by DOT.

Alternative 2 would have the least visual impact to adjacent homeowners due to the open design of the pipe rail fence. Effects to existing aesthetics would be minor under this alternative.

3.12. 4 Environmental Consequences of Alternative 3: High Security Fencing

Alternative 3 represents the greatest potential for aesthetic impact. The fence design under this alternative includes the construction of an eight-foot-high combined high security fence within one foot of the property line along the entire boundary (Figures 4 and 7), topped with three strands of barbed wire. This design would substantially impede the view from neighboring private property, representing a moderate to severe impact to aesthetics.

3.12.5 Environmental Consequences of Alternative 4: Setback Fencing

Effects to existing aesthetics would be minor to moderate under this alternative. The impacts to aesthetics from the proposed new fencing would be more pronounced in areas where currently no fencing exists. The setback fencing design would involve the installation of pipe rail fencing within one foot of the installation border and the placement of an eight-foot chain link fence setback a distance from the pipe rail fence (Figures 3 and 8). The setback chain link fencing would not be as visually offensive as the high security fencing proposed in Alternative 3, but would still have a greater visual effect than Alternative 2 (pipe rail only). The impact to aesthetics would be moderate under this alternative.

3.12.6 Mitigation

No mitigation measures are proposed.

3.13 Cumulative Impacts from the Proposed Action and Alternatives

The following is a discussion of cumulative environmental impacts, defined under CEQ Regulation 1508.7 and 32 CFR Part 651, related to all alternatives. Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can also result from individually minor but collectively significant actions taking place locally or regionally over a period of time.

3.13.1 Present and Future Actions

There are several projects planned for Fort Richardson that represent potential impacts similar to the proposed action. While these projects are independent of the proposed action described in this document, it is nevertheless appropriate to consider impacts associated with the proposed action and other alternatives in light of these independent projects.

3.13.1.1 Capital Improvement Projects

Fort Richardson is undertaking or planning a variety of small capital improvement projects which will be situated within the installation's cantonment. These include the removal of existing structures that are no longer serviceable, and the construction of new structures such as soldiers' barracks, and training and support facilities. These new facilities either have been located or will be located within that section of Fort Richardson that has undergone substantial development over the past 50 years. The existing environmental setting within the cantonment area is comparable to the well-developed sections of neighboring Anchorage.

3.13.1.2 USARAK Force Transformation. Planned to begin this summer, the 172nd Infantry Brigade at Forts Richardson and Wainwright will transform into a Stryker Brigade Combat Team. As proposed, transformation of USARAK forces represents substantial changes in the way Army Alaska will operate. Foremost are the stationing of several hundred new armored combat and support vehicles, plus the addition of approximately 1,000 new personnel. The potential environmental impact to all USARAK installations and training lands as a consequence of these changes is set forth in a Transformation of U.S. Army Alaska Final Environmental Impact Statement [69 Fed. Reg. 21501, Apr. 21, 2004].

3.13.1.3 Elmendorf Air Force Base (EAFB) Private Sector Financed Military Family Housing Project.

Fort Richardson is in the process of transferring administrative control of approximately 350 acres to neighboring EAFB. This section of land is situated immediately north of Bartlett High School at the corner of Glenn Highway and Muldoon Avenue. Once the property is transferred to Air Force control, EAFB proposes to undertake a project whereby the private sector will construct as many as 570 family units on the property. The environmental consequences of this project are set forth in a draft Environmental Assessment that has been made available for public comment. The Air Force expects to issue a decision document on this review in May 2004.

3.13.1.4 Alaska Railroad Corporations (ARRC) Track Realignment Project

Alaska Railroad Corporation is realigning approximately 10 miles of railroad track on EAFB and Fort Richardson. The realigned track moves along the same general corridor as the existing track, but the numerous curves in the existing track are being removed to improve the level of service and reduce the number of unsafe crossings. The environmental consequences of this project are set forth in an Environmental Assessment.

3.13.2 Air Quality

All current and planned projects have the potential to impact local air quality. These impacts consist of dust generated from ground and vegetation disturbance during the construction phase of the various projects; increased use of unimproved roads for initial Stryker training; use of motorized construction equipment; and increased exhaust emissions from natural-gas fueled heating systems within the new structures. Mitigating efforts and best management practices would serve to make dust a temporary and insignificant concern. Emissions generated by construction equipment would also be temporary and insignificant. Discontinuance of power production at the Fort Richardson Central Heating and Power Plant serves to offset the minor

emissions from new infrastructure heating equipment. Overall cumulative impact to local air quality will be minor.

3.13.3 Vegetation

The fencing project in conjunction with capital improvements planned within the current Fort Richardson boundaries, the EAFB housing initiative, and the railroad realignment represent a cumulative loss of less than 550 acres of undeveloped land within the approximate 61,000 acres of Fort Richardson. Vacated railroad right of way will be restored and revegetated with native plant species. Additionally, areas disturbed during construction of realigned track will be restored to control erosion, drainage, and establish vegetative cover on exposed soil. Use of armored vehicles and additional training associated with transformation is expected to have a minor impact to vegetation. Fort Richardson's adaptive natural resource management techniques and individual project restoration plans serve to monitor and mitigate loss of vegetation and allow for necessary changes to training activities to prevent significant habitat loss. Overall cumulative impact from these projects will be minor.

3.13.4 Fisheries and Wetlands

The fencing project could result in a slight loss of unimpeded fish passage along the edge of anadromous waterways on Fort Richardson during severe flooding events. The fencing project could also result in the loss of approximately 1,052 linear feet of undisturbed riparian vegetation along the banks of the waterways. This distance represents 0.3 % of the approximately 390,400 linear feet of anadromous streambank located on Fort Richardson. While construction of the fencing project, the EAFB housing initiative, the railroad realignment and increased training activities have the potential to increase erosion and siltation of streams, best management practices would ensure these projects result in minor impact to water bodies within Fort Richardson. Neither the EAFB housing initiative nor Fort Richardson cantonment capital improvement projects would be located within an existing floodplain. Wetlands will be disturbed during construction of the realigned railroad track, however all work will be performed in accordance with a permit issued by the US Army Corps of Engineers. The wetlands permit requirements limit disturbance of wetlands and protect the integrity of wetland hydrology. The railroad realignment project is the only current or proposed activity that results in a net loss of wetlands on Fort Richardson. However, because of the proposed mitigation measures for the installation fencing project, there will be no additional impacts in addition to those caused by the realignment project. Overall cumulative impact will be minor.

3.13.5 Recreation

The proposed installation fencing project would have a very minor impact to recreational use of Fort Richardson. Procedures for granting authorized recreational access would remain unchanged. The Air Force housing initiative would result in the discontinuance of informal recreational use of that land by Bartlett High School students. Transformation of USARAK forces will result in increased training activities and will result in more frequent closure of undeveloped areas on the installation, but overall impact is expected to be minor. The cumulative impact of these actions will be minor.

3.13.6 Wildlife

Any barrier that impedes seasonal movement of wildlife has the potential to impact the population. Alternative 2, the preferred alternative, will not significantly impede the seasonal movement of small, medium or large animals within Fort Richardson. Development of the Air Force housing initiative will eliminate approximately 350 acres of moose winter habitat. In coordination with the Alaska Department of Fish and Game, EAFB will mitigate this loss by setting aside land that will be improved and managed for moose winter habitat. While the increased training activities and vehicle operation within Fort Richardson training lands would disturb residing wildlife, moose and other local species are very adaptive. The railroad realignment project mitigates impacts to moose by restoring the vacated alignment to encourage high-quality moose brows vegetation and creation of additional habitat away from the track. This will result in creation and enhancement of approximately 90 acres of moose habitat which is one and a half times the habitat lost due to construction. Additionally, the adaptive natural resource management techniques employed at Fort Richardson serve to monitor wildlife populations and adjust activities where needed. Overall cumulative impact from current and proposed projects will be minor.