CHAPTER 4

Environmental and Socioeconomic Consequences

4.1 Introduction

This chapter presents the environmental and socioeconomic consequences of implementing the Proposed Action Alternatives and the No Action alternative analyzed in this *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (Aviation Environmental Impact Statement [EIS] or EIS). This chapter qualitatively and quantitatively evaluates the potential environmental impacts of U.S. Army Alaska's (USARAK's) Proposed Action.

4.1.1 Alternatives

The alternatives analyzed in this EIS are summarized below (see Chapter 2 for a detailed description of the Proposed Action alternatives and the No Action alternative).

- **Alternative 1: No Action Alternative.** Under the No Action alternative, USARAK would continue to use existing units and assets to support aviation and integrated training requirements. USARAK's current aviation assets consist of 490 Soldiers and 32 helicopters.
- **Alternative 2: Aviation Task Force.** This alternative would convert existing USARAK aviation assets into an Aviation Task Force (Task Force). The Task Force would consist of approximately 1,200 personnel and 72 helicopters. An additional 710 Soldiers and 40 helicopters would augment USARAK's existing aviation assets. The Kiowa helicopter would also be added to the current inventory of Chinooks and Blackhawks. Additional Soldiers and helicopters would be stationed only at Fort Wainwright (FWA), and increased aviation training would be conducted on existing USARAK lands at FWA and Donnelly Training Area (DTA). New infrastructure would be required at FWA.
- **Alternative 3: Combat Aviation Brigade.** This alternative would expand existing USARAK aviation assets into a Brigade. A Combat Aviation Brigade (Brigade or CAB) consists of approximately 2,850 personnel and 116 helicopters. An additional 2,360 Soldiers and 84 helicopters would augment USARAK's existing aviation assets. The Kiowa and Apache helicopters would also be added to the current inventory of Chinooks and Blackhawks. Although USARAK would prefer to station all new Soldiers and helicopters at FWA, it is unlikely that FWA would have the capacity to accommodate the additional aircraft, support staff, and dependents. For this reason, Alternative 3 includes stationing of a portion of Soldiers and helicopters at Fort Richardson (FRA) and Eielson Air Force Base (AFB). Of the 2,360 additional Soldiers, an estimated 1,476 would go to FWA, and 442 each would go to FRA and Eielson AFB. Dependents and civilian workers associated with these Soldiers would be divided proportionately among the three installations. An additional 40 helicopters would be

stationed at FWA, 20 helicopters would be stationed at FRA, and 24 helicopters would be stationed at Eielson AFB. Increased aviation training would occur on existing USARAK lands at FWA, FRA, and DTA. Additional infrastructure would be required at FWA.

4.1.2 Format of Analysis

Each of the EIS alternatives is evaluated in the context of valued environmental components (VECs), which are defined as the resources, ecosystems, and human communities of concern that could be affected by the Proposed Action (see Subsections 1.4.2 and 3.1.1).As described in Subsection 3.1.2, the following VECs have a low potential to be affected and are not analyzed in further detail in Chapter 4.

- Traffic/Transportation Systems
- Vegetation
- Wetlands
- Fire Management
- Geological Resources
- Safety
- Land Use/Energy/Utilities
- Environmental Justice

The analysis in Chapter 4 focuses on the VECs that have the potential to be adversely affected by the Proposed Action alternatives. The Primary VECs are those that were determined to have a high potential for significant impacts, and the Secondary VECs are those that were determined to have a medium potential for significant impacts. This EIS analyze the direct and indirect impacts of each of the VECs listed as Primary or Secondary (cumulative impacts are presented in Section 4.12).

- Primary VECs—High Potential for Impact
  - Section 4.2 Airspace Management
  - Section 4.3 Cultural and Visual Resources
  - Section 4.4 Noise
  - Section 4.5 Hazardous Materials/Hazardous Waste
  - Section 4.6 Wildlife and Fisheries (including Threatened and Endangered Species and Species of Concern)

- Secondary VECs—Medium Potential for Impact
  - Section 4.7 Air Quality
  - Section 4.8 Socioeconomics
  - Section 4.9 Soils and Permafrost
  - Section 4.10 Water Resources (Surface Water and Groundwater)
  - Section 4.11 Subsistence and Recreation

4.1.3 Significance Criteria and Mitigation

4.1.3.1 Significance Criteria

In order to determine whether the Proposed Action has the potential to cause significant impact, criteria are presented for each of the Primary and Secondary VECs analyzed in this

chapter. The criteria are based on relevant and applicable federal, State, and local statutes and regulations. In addition, relevant best management practices (BMPs) and appropriate Army guidance and directives are used to determine criteria used to measure the potential degree of environmental impact.

4.1.3.2 Mitigation

Following the analysis of the impacts associated with each alternative for each VEC, this EIS offers a list of potential mitigation measures designed to reduce potential impacts to the resource. Subsection 1.4.3 describes other relevant planning documents that can also be referenced for existing Army mitigation measures.

4.2 Airspace Management

The greatest potential affect on USARAK's airspace requirements are unit deployment preparation and routine training events. The proposed increase in Soldiers and aircraft under the Proposed Action alternatives would increase the frequency of both these events, which may lead to additional stress on preexisting airspace resources. The following sections examine the extent of the potential impacts to airspace resources as a result of increased helicopter training intensity and frequency under the Proposed Action alternatives.

4.2.1 Significance Criteria

Interactions between military and civilian aircraft could occur under any alternative. Interactions typically involve congestion and delay for military or civilian airspace users. In rare instances, congestion could increase the possibility for mid-air collisions. During the 10 years ending in 2002, the State of Alaska experienced 20 mid-air collisions, 80 percent of them involving general aviation (GA) aircraft. Although neither of the Proposed Action alternatives would change airspace structure or air traffic procedures, each would increase the level of helicopter activity, thus increasing the possibility of such interaction. These interactions could occur anywhere outside of restricted airspace, but are most likely to occur in flight corridors used jointly by civil and military aircraft. Because USARAK helicopters operating outside of dedicated training areas typically operate at altitudes between 500 and 1,000 feet above ground level (AGL), such aircraft are most likely to encounter private or GA aircraft, which also operate at these altitudes, in those areas that are used by both (see Figures 3.2.a and 3.2.b). The following sections examine potential effects of the alternatives under consideration with respect to the criteria in Table 4.2.a. Descriptions of these evaluation criteria follow the table.

TABLE 4.2.a
Airspace Management Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Safety	Changes in the nature or complexity of flight operations in airspace jointly used with civilian aircraft that would reduce the ability of pilots to comply with regulatory standards for separation of aircraft, aircraft and physical structures, and aircraft and airspace surfaces.
Predictability	Creation of inconsistent and/or unpredictable air traffic flows such to hamper civil aviation flight planning.
Accessibility	Reduction in general or commercial aviation access as a result of an increase in the area covered by Restricted Airspace.

4.2.1.1 Safety

This criterion addresses potential changes in the type and/or intensity of military flight activity that might affect aviation safety standards and increase the likelihood of aircraft collisions. Federal Aviation Regulations Part 91, Section 91.111 states: "No person may operate an aircraft so close to another aircraft as to create a collision hazard." Maintaining safe operations, therefore, is the responsibility of the pilot in command. The State of Alaska experienced an average of two mid-air collisions a year over the 10 years ending in 2002 (FAA, 2003). Eighty percent of the collisions involved GA aircraft and the remainder involved air taxi operators; no military aircraft were involved (FAA, 2003). The Federal Aviation Administration (FAA) Alaska Region notes that recent National Transportation Safety Board (NTSB) studies of mid-air collisions involving aircraft (FAA, 2003) determined that:

- Most of the aircraft involved in collisions are engaged in recreational flying, not on any type of flight plan.
- Most mid-air collisions occur in visual flight rules (VFR) weather conditions during weekend daylight hours.
- The vast majority of accidents occurred at or near uncontrolled airports and at altitudes below 1,000 feet.
- Pilots of all experience levels were involved in mid-air collisions, from pilots on their first solo ride to 20,000-hour veterans.
- Flight instructors were on board the aircraft in 37 percent of the accidents studied.
- Most collisions occur in daylight with visibility greater than 3 miles.

USARAK has established procedures to maintain separation between its own aircraft, U.S. Air Force (USAF) traffic, and civilian traffic. The nature of helicopter operations in Alaska airspace requires particular diligence to ensure safety in airspace shared with civilian aircraft. Most USARAK helicopters in the Alaska airspace operate in the altitude stratum that experiences the vast majority of collisions. Uncontrolled airports are concentrated around the major urban areas and along the VFR flight corridors. USARAK aircraft operate in these areas for training. In such areas, pilots are responsible for seeing and avoiding other aircraft.

The relationships between traffic levels, complexity, and safety dynamic, and for that reason, it is not possible to establish a quantitative threshold of significance. Increasing the number of military aircraft using congested facilities or increasing the complexity of traffic patterns can decrease the ability of pilots to anticipate and react to other aircraft, thus adversely affecting safety.

4.2.1.2 Predictability

This criterion addresses changes in the type and intensity of military flight activity that would result in inconsistent or unpredictable congestion or restrictions on airspace that might adversely affect civil aviation flight planning. Examples of such impacts could include decreasing the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increasing the variability of typical flight operations. Because

the amount of notice or predictability needed varies with the individual airspace user, it is not possible to establish a quantitative threshold of significance. USARAK flight operations experience periods of intense activity in support of training exercises. By participating in the Notice to Airmen (NOTAM) system and Alaska Civil Military Aviation Council (ACMAC) meetings, and by inviting the FAA, USAF, and general aviation (GA) representatives to quarterly USARAK Aviation Safety Standard Council meetings, USARAK alerts the civilian and military aviation communities about upcoming exercises and other periods of intense training activity. Under any alternative, the USARAK aircraft would continue to conform to existing flight corridors and most air travel would occur within military installation boundaries.

4.2.1.3 Accessibility

Restricted airspace is set aside for the exclusive use of the military. They are permanently allocated, although if not active, access to the airspace may be granted to civilian users. Expansion of existing restricted airspace or the addition of new restricted areas would limit accessibility to airspace currently accessible to civilian aircraft. Any such changes would require FAA action and NEPA review. Changes in the type and intensity of military flight activity that affect the frequency and duration of use of restricted areas conversely reduce access to civilian users. Access is managed through established communications and coordination procedures. By participating in the NOTAM system attending ACMAC meetings, and by inviting the FAA, USAF, and GA representatives to quarterly USARAK Aviation Safety Standard Council meetings, USARAK maintains a dialogue with the GA community to exchange information about unanticipated changes in operational conditions.

4.2.2 Environmental Consequences for Airspace Management

4.2.2.1 Alternative 1: No Action

The No Action alternative represents the continuation of current activity levels and airspace usage. The following subsections describe the existing volume and distribution of USARAK helicopter activity, and current interaction with other airspace users. The No Action alternative serves as the baseline against which the potential airspace management impacts of the other alternatives are assessed.

4.2.2.1.1 Aviation Personnel

Under the No Action alternative, there would be no change in the number of personnel stationed at FWA, and no airspace impacts would occur.

4.2.2.1.2 Aviation Assets

USARAK would continue to use its existing military vehicles and generators as part of the No Action alternative. These assets would not affect airspace.

4.2.2.1.3 Facilities Construction and Demolition

Under the No Action alternative, there would be no need for new construction or demolition of existing facilities to support an Aviation Task Force or CAB. Airspace would not be affected.

4.2.2.1.4 Military Training

Table 4.2.b shows the current level of helicopter training activities (takeoffs and landings) conducted by USARAK and Army National Guard helicopters at FWA, FRA, and Donnelly Training Area (DTA) in 2006. The No Action Alternative would not change the current number of USARAK helicopters or helicopter operations, and it would not alter the 4,800 takeoffs and landings conducted by the Army National Guard at Bryant Army Airfield (AAF). Under this Alternative, 32 USARAK helicopters would continue to generate 3,860 annual operations. Less of the Army National Guard activity at Bryant AAF, about 95 percent of current takeoffs and landings (3,672 annual operations) would be conducted at FWA (Ladd AAF), with the remaining 5 percent (188 annual operations) at DTA (Allen AAF).

TABLE 4.2.b
USARAK Existing Airspace Usage: Based Helicopters and Airfield Activity
USARAK Aviation EIS

		Helicopter Operations[a]					
	USARAK Permanently Based	**Average Day**			**Average Month**	**Peak Day**	**Annual**
	Helicopters	**Day**	**Night**	**Total**	**Total**	**Total[b]**	**Total**
Fort Richardson – Bryant AAF[c]							
Blackhawk UH-60	0	17.5	2.5	20.0	400	64.0	4,800
Subtotals	**0**	**17.5**	**2.5**	**20.0**	**400**	**64.0**	**4,800**
Fort Wainwright – Ladd AAF[d]							
Chinook CH-47	12	2.2	0.6	2.8	56	2.8	672
Kiowa OH-58D	0	0	0	0	0	0	0
Blackhawk UH-60/HH-60	20	9.4	3.1	12.5	250	32.0	3,000
Subtotals	**32**	**11.6**	**3.7**	**15.3**	**306**	**36.1**	**3,672**
Donnelly Training Area – Allen AAF[e]							
Chinook CH-47	0	0.3	0.1	0.4	8	0.4	96
Blackhawk UH-60	0	0.3	0.1	0.3	7	1.0	92
Subtotals	**0**	**0.6**	**0.2**	**0.7**	**15**	**1.4**	**188**
Grand Total	**32**	**29.6**	**6.4**	**36.0**	**721**	**101.4**	**8,660**

Notes and Data Sources:
[a] An operation is either one takeoff or one landing. Annual estimates based on the assumption that 1 year represents 12 average months; 1 average month equals 20 "average" days. Note that the average day represents a typical flying day, not an annual average day. Values rounded to nearest tenth decimal place or whole number.
[b] Peak day represents activity during a training event. For this alternative, it is assumed that a peak day would coincide with one of the annual door gunnery exercises conducted at FRA (Reid, 2006).
[c] Helicopter activity at Bryant AAF consists entirely of Army National Guard training (CHPPM, 2007a; CHPPM, 2007b).
[d] CHPPM, 2007a; CHPPM, 2007b.
[e] Reid, 2006.

The following analysis evaluates the potential effects of this alternative on the airfields, flight corridors, and training facilities that comprise the airspace resources at FWA and Eielson AFB, FRA, and the DTA. For each of these components, the analysis considers the effect of the alternative with respect to the three evaluation criteria described in Subsection 4.2.1: safety, predictability, and accessibility.

Fort Wainwright and Eielson AFB

There would be no change to the existing conditions upon implementation of Alternative 1. The 32 USARAK helicopters based at FWA would continue to generate approximately 3,860 annual operations. Within the FWA and Eielson AFB area, USARAK helicopters would continue to travel from Ladd AAF to Yukon Training Area (YTA) and Tanana Flats Training Area (TFTA) via the flight corridors shown in Figure 3.2.a. This alternative would have the following effects on the airfields, corridors, and facilities in this airspace.

- **Airfields.** USARAK helicopter activity at Ladd AAF would continue at current levels. As shown in Figure 3.2.a, Ladd AAF, Eielson AFB, and Fairbanks International Airport are contained in single Terminal Radar Service Area (TRSA) with associated Class D airspace. In addition, about eight other small airfields are located in this area, which is generally Class E airspace. Coordination between instrument flight rule (IFR) and participating VFR aircraft in this area would continue to occur under the control of the air traffic control (ATC) tower at Ladd AAF, reducing the potential for incidents. Ladd AAF's ATC tower would continue to maintain airspace standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace surfaces. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. There would be no additional activity at any of the airfields in the area and civilian users' access to aviation facilities or airspace resources would not change from the current conditions under Alternative 1.

- **Corridors**. USARAK helicopters would continue to travel between the training areas and Ladd AAF using the helicopter flight corridors shown in Figure 3.2.a. USARAK helicopters are most likely to interact with other air traffic flying under VFR in Class E airspace, where helicopter flight routes cross the VFR Corridor. Under this alternative, the potential for interaction with GA aircraft would not change from current conditions. While pilots are responsible for maintaining visual separation in parts of this area, continuation of the proven airspace management policies and practices would assist military and civilian pilots in maintaining separation standards. Continuation of current policies and coordination would also continue to enable other airspace users to predict upcoming USARAK activities, plan their flights accordingly, and allow civilian access to airspace and airports.

- **Training Facilities**. Alternative 1 would result in continued use of the TFTA and YTA at the existing activity levels (see Figures 2.3.b, 2.3.d, and 3.2.a). While the training areas are not defined as Special Use Airspace (SUA), interactions with GA are less likely to occur in training areas than in the VFR corridors. GA use in TFTA and YTA is limited by Restricted Areas (R-2211 and R-2205), which require GA aircraft to communicate with controllers before transiting the areas. USARAK activity levels in the Restricted Areas under Alternative 1 would remain unchanged (Table 4.2.b) and would not increase interaction with civilian aircraft. Figure 3.2.a shows that these Restricted Areas cover approximately half of the YTA and a relatively small portion of the TFTA. Over half of the TFTA is within a TRSA, which provides air traffic control for civilian and military IFR and participating VFR aircraft. Pilots outside of these areas would continue to be responsible for maintaining visual separation from other aircraft. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1

would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of Alternative 1 would not change the airspace categories, and GA users would continue to be allowed to enter Restricted Areas upon being granted permission.

Under the No Action alternative, USARAK helicopters would continue to occasionally perform aerial reconnaissance training exercises within the city of Fairbanks and North Pole. Aerial reconnaissance training consists of helicopters in the air following/tracking ground-based vehicles. Fairbanks and North Pole are used because the FWA cantonment area does not provide a large enough urban setting to effectively train Soldiers. Helicopters typically fly at 500 to 1,000 feet AGL, and do not land outside of military lands (unless there is an emergency). All urban training activities comply with existing FAA flight rules, are coordinated with FAA and local authorities, and involve public notification. These training events occur up to 2 days per quarter and consist of four helicopters in the air at one time.

Operations under Alternative 1 would be the same as under current conditions and, therefore, no impact to airspace management at FWA and Eielson AFB would result.

Fort Richardson

Currently, all of the activity at Bryant AAF consists of Army National Guard operations. Alternative 1 would not increase USARAK activity at FRA. Operations under Alternative 1 would be the same as under current conditions and, therefore, no impact to airspace management at FRA would result.

Donnelly Training Area

Implementation of Alternative 1 would result in no change to the current operation and use of DTA. USARAK helicopters training in the DTA would continue to stage out of Ladd AAF and other forward operating bases (FOBs) and forward area arming and refueling points (FAARPs) in the training area. Helicopters from Ladd AAF would travel to DTA (and Allen AAF) via established flight corridors as shown in Figure 3.2.a. Training at DTA would continue at existing levels. This alternative would have the following effects in the airfields, corridors, and facilities in this airspace.

- **Airfields.** USARAK helicopter use of Allen AAF would continue to be minimal as shown in Table 4.2.b. The area around Delta Junction includes the Class D airspace associated with Allen AAF. Otherwise, this area is mostly Class E airspace, which also includes numerous Military Operating Areas (MOAs) (see Figure 3.2.a). In addition to the Delta Junction Airport, about five small and/or private airfields are located in the general area. The most likely interaction with other air traffic would be with GA aircraft using the VFR Corridor along the Richardson Highway, as shown in Figure 3.2.a. The standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace surfaces would continue to be employed. Continuation of the airspace management policies and coordination practices would provide predictability of USARAK activities. Allen AAF would not be used by civilian aircraft, so implementation of Alternative 1 would not deny civilian users access to aviation facilities.

- **Corridors.** There would be no increase in the number of USARAK helicopters transiting between FWA and DTA. Helicopters would continue to use established flight corridors.

The Birch, Alaska Highway, and Richardson Highway VFR corridors are located in the vicinity of helicopter flight corridors near DTA, south of TFTA (see Figures 3.2.a and 3.2.b). The greatest chance for interaction with GA would occur where the helicopter flight corridor crosses the VFR corridors. Such crossings occur at the western end of the Birch VFR Corridor, at the northern end and near the middle of the Richardson Highway VFR Corridor, and within the Quartz Lake MOA and Class D airspace for Allen AAF. The airspace management policies and practices listed in Subsection 3.2.1.1 and described above would continue to assist military and civilian pilots in maintaining separation standards. Continuation of policies and coordination practices would enable other airspace users to predict upcoming USARAK activities, plan their own flights accordingly, and ensure that increased use of helicopter flight routes between the airfields and the training areas would not deny civilian access to airspace or airports.

- **Training Facilities.** Alternative 1 would result in no change in activity and use of DTA from current conditions (Table 4.2.b). Restricted areas (R-2202B, R-2202C, R-2202A, and R-2202C) cover a majority of the DTA, thus limiting GA use and requiring GA aircraft allowed to transit the areas to communicate with controllers. Airspace management policies and coordination practices currently used would continue to provide predictability of upcoming USARAK activities. Implementation of Alternative 1 would not change the airspace categories and policies, and would not further restrict civilian access to airspace resources.

Operations under Alternative 1 would be the same as under current conditions and, therefore, no impact to airspace management at DTA would result.

4.2.2.2 Alternative 2: Aviation Task Force

4.2.2.2.1 Aviation Personnel

Under Alternative 2, additional military aviation personnel would be stationed at FWA. The effects of the additional military training conducted by the additional personnel are addressed in Subsection 4.2.2.2.4.

4.2.2.2.2 Aviation Assets

Alternative 2, establishment of an Aviation Task Force, would introduce an additional 40 aircraft at FWA only. A total of 72 USARAK helicopters would be based at FWA as part of the new organization, a 125 percent increase compared with the No Action alternative. These aircraft would include medium- and heavy-lift helicopters, and combat-scout helicopters. The effects of the additional military training associated with these additional assets are addressed in Subsection 4.2.2.2.4.

4.2.2.2.3 Facilities Construction and Demolition

Under Alternative 2, construction and demolition would occur at Ladd AAF at FWA. Construction and demolition of facilities would not directly or indirectly lead to changes to airspace safety, predictability, accessibility, or management as discussed in Subsection 4.2.1 because these facilities would be constructed at an existing, active military airfield. Changes in airspace usage are addressed in Subsection 4.2.2.2.4.

4.2.2.2.4 Military Training

Alternative 2 would involve increased aviation training requirements for USARAK. Seventy-two USARAK helicopters would conduct an estimated 10,160 annual operations (at FWA and DTA) under this alternative, more than twice as many operations as under the No Action alternative Nearly all (98 percent) of these takeoffs and landings would occur at FWA, with the remainder at DTA. In addition, the Army National Guard would continue to conduct 4,800 takeoffs and landings at FRA, as described under Alternative 1. Table 4.2.c shows the distribution of helicopter activity, including the activity of the Army National Guard aircraft at FRA. A synopsis of the effects of Alternative 2 at specific facilities follows.

TABLE 4.2.c
Alternative 2: Aviation Task Force—Proposed Based Helicopters and Airfield Activity
USARAK Aviation EIS

		Proposed Helicopter Operations[a]					
	Proposed Based	Average Day			Average Month	Peak Day	Annual
	Helicopters	Day	Night	Total	Total	Total[b]	Total
Fort Richardson – Bryant AAF[c]							
Blackhawk UH-60	0	17.5	2.5	20.0	400	64	4,800
Subtotals	**0**	**17.5**	**2.5**	**20.0**	**400**	**64**	**4,800**
Fort Wainwright – Ladd AAF[d]							
Chinook CH-47	12	2.2	0.6	2.8	56	24.0	672
Kiowa OH-58D	30	15.0	5.0	20.0	400	120.0	4,800
Blackhawk UH-60/HH-60	30	14.0	4.7	18.8	375	78.0	4,500
Subtotals	**72**	**31.3**	**10.3**	**41.6**	**831**	**222.0**	**9,972**
Donnelly Training Area – Allen AAF[e]							
Chinook CH-47	0	0.3	0.1	0.4	8	3.4	96
Blackhawk UH-60	0	0.3	0.1	0.3	7	1.5	92
Subtotals	**0**	**0.6**	**0.2**	**0.7**	**15**	**4.9**	**188**
Grand Total	**72**	**49.3**	**13.0**	**62.3**	**1,246**	**291**	**14,960**

Notes and Data Sources:
[a] An operation is either one takeoff or one landing. Annual estimates based on the assumption that 1 year represents 12 average months; 1 average month = 20 "average" days. Note that the average day represents a typical flying day, not an annual average day. Values rounded to nearest tenth decimal place or whole number.
[b] Peak day represents during a training event. For this alternative, it is assumed that a peak day would coincide with one of the annual door gunnery exercises conducted at FRA (Reid, 2006).
[c] All activity conducted by Army National Guard aircraft (CHPPM, 2007a; CHPPM, 2007b).
[d] CHPPM, 2007a; CHPPM, 2007b.
[e] Reid, 2006.

The following analysis documents the effects of Alternative 2 on the airfields, corridors, and training facilities that comprise the airspace resources at FWA and Eielson AFB, FRA, and the DTA. For each of these components, the analysis considers the effect of the alternative with respect to the three evaluation criteria described in Subsection 4.2.1: safety, predictability, and accessibility.

Fort Wainwright and Eielson AFB

Forty additional helicopters would be stationed at FWA upon establishment of an Aviation Task Force. Within the FWA and Eielson AFB area, USARAK helicopters would travel from Ladd AAF to YTA and TFTA via the flight corridors shown in Figure 3.2.a. This alternative would have the following effects on the airfields, corridors, and facilities in this airspace.

- **Airfields.** The Aviation Task Force would increase USARAK helicopter activity at Ladd AAF. The fact that aircraft operating at Ladd AAF would be under the control of the air traffic control tower increases the coordination among aircraft and reduces the potential for incidents. The USARAK activity levels would increase by 27 (from 15 to 42) landings

and takeoffs on an average day, equating to approximately 2 per hour during a 12-hour day. This level of increase would not prevent the tower from maintaining the standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace surfaces. Implementation of this alternative would increase activity levels at Ladd AAF and the surrounding airspace, but would not increase the complexity of flight patterns in and around the regional airports. Furthermore, implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Ladd AAF is not used by civilian aircraft; therefore, increased activity at this airfield would not deny civilian users access to aviation facilities or airspace resources.

- **Corridors.** The Aviation Task Force would also increase the volume of USARAK helicopters transiting between the training areas and Ladd AAF using the helicopter flight corridors shown in Figure 3.2.a. With the increased activity, there would be increased potential for interaction with GA aircraft, especially where the helicopter flight routes cross the VFR corridors. Implementation of this alternative would increase activity levels in and around the VFR Corridor, but would not alter the typical flight patterns in this area. The addition of 27 USARAK landings and takeoffs at Ladd AAF would increase traffic levels in the VFR Corridor and other unrestricted airspace, but not to the degree that pilots would be unable to see and avoid other aircraft. Therefore, this alternative would have a minor adverse affect on safety; however, given the relatively small number of aircraft involved, the impact would not be significant. Pilots are responsible for maintaining visual separation in parts of this area and continuation of the proven airspace management policies and practices described in Subsection 3.2.1.1 would assist military and civilian pilots in maintaining separation standards. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of airspace management policies and coordination practices would also enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of this alternative would not increase or widen flight corridors. By adhering to these policies and practices, USARAK operations would continue to allow civilian access to airspace and airports as activity levels increase.

- **Training Facilities.** Implementation of Alternative 2 would result in increased activity and use of TFTA and YTA during training events (see Figures 2.3.b, 2.3.d, and 3.2.a). While the training areas themselves are not defined SUA, interactions with GA are less likely to occur in training areas than in the VFR corridors. Restricted Areas (R-2211 and R-2205) in TFTA and YTA limit GA use in those portions of the training areas and require GA aircraft allowed to transit the areas to communicate with controllers. For these reasons, increased USARAK activity levels in the Restricted Areas are not likely to increase interaction with civilian aircraft. Figure 3.2.a shows that these Restricted Areas cover approximately half of the YTA and a relatively small portion of the TFTA. More than half of the TFTA is within a TRSA, which provides ATC for civilian and military IFR and participating VFR aircraft. Pilots outside of these areas would continue to be

responsible for maintaining visual separation from other aircraft. Implementation of this alternative would increase activity levels in and around the VFR Corridor, but would not alter the typical flight patterns in this area. The addition of 27 USARAK landings and takeoffs at Ladd AAF would increase traffic levels in the VFR Corridor and other unrestricted airspace, but not to the degree that pilots would be unable to see and avoid other aircraft. Therefore, this alternative would have a minor adverse affect on safety; however, given the relatively small number of aircraft involved, the impact would not be significant. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Therefore, this alternative would not adversely affect civil aviation flight planning. Implementation of Alternative 2 would not change the airspace categories, and GA users would continue to be allowed to enter Restricted Areas upon being granted permission; thus, there would be no impacts to accessibility of GA users in training areas.

The requirements and frequency of aerial reconnaissance training would be similar to the No Action alternative, and would include all types of USARAK helicopters stationed at FWA under Alternative 2. USARAK would continue its process of public notification and coordination in advance of urban reconnaissance training events.

Implementation of Alternative 2 would increase activity levels at Ladd AAF and associated training corridors. Because airspace standards would continue to be maintained, the potential impacts resulting from implementation of Alternative 2 on safety would be less than significant.

There would be no change in the implementation of airspace management policies and coordination practices described in Subsection 3.2.1.1; therefore, no impact to predictability would result. Implementation of Alternative 2 would not change the airspace categories and, therefore, no impacts to accessibility would result.

There would be no impact to operations at Eielson AFB.

Fort Richardson

As in the No Action alternative, all of the activity at Bryant AAF consists of Army National Guard operations. Under Alternative 2, no increase in USARAK helicopter activity at FRA is proposed. Because there would be no change in operations, no impact to airspace management would occur at FRA.

Donnelly Training Area

Establishment of the Aviation Task Force under Alternative 2 would increase training flights within the DTA. Helicopters from Ladd AAF would travel to DTA (and Allen AAF) via established flight corridors as shown in Figures 3.2.a. Increased training would also occur in the DTA. This alternative would have the following effects to the airfields, corridors, and facilities within the airspace nearest DTA.

- **Airfields.** Most of the training activity associated with DTA would originate from Ladd AAF and, ultimately, helicopters would be staged out of various FOBs and FAARPs in

the training area. Consequently, USARAK helicopter use of Allen AAF would be minimal. This minimal increase in activity would not prevent the ATC towers at both Allen AAF and Ladd AAF from maintaining the standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace surfaces. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Allen AAF is not used by civilian aircraft, so increased activity at this airfield would not deny civilian users access to aviation facilities.

- **Corridors.** This area would experience an increase in USARAK helicopters transiting between FWA and DTA in established flight corridors as noted above. VFR corridors are located in the vicinity of DTA (Figures 3.2.a and 3.2.b). While pilots are responsible for maintaining visual separation in parts of this area, continuation of the proven airspace management policies and practices described in Subsection 3.2.1.1 would assist military and civilian pilots in maintaining separation standards. Implementation of this alternative would increase activity levels in and around the VFR Corridor, but would not alter the typical flight patterns in this area. The addition of 27 USARAK landings and takeoffs at Ladd AAF would increase traffic levels in the VFR Corridor and other unrestricted airspace, but not to the degree that pilots would be unable to see and avoid other aircraft. Therefore, this alternative would have a minor adverse affect on safety. Assuming that each of the 10 additional average daily USARAK helicopter takeoffs at Ladd AAF generates a flight to DTA, and that 10 percent of the daily traffic volume would occur during the peak hours, the resultant volume of air traffic (one additional aircraft during peak times) would be minor and not prevent pilots from maintaining separation standards. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of airspace management policies and coordination practices would enable other airspace users to predict upcoming USARAK activities, plan their own flights accordingly, and ensure that increased use of helicopter flight routes between the airfields and the training areas would not deny civilian access to airspace or airports. Implementation of this alternative would not expand Restricted Areas or other SUA.

- **Training Facilities.** Implementation of Alternative 2 would result in increased activity and use of DTA. The Aviation Task Force is expected to conduct door gunnery and tactical training in the DTA (see Figures 2.3.c and 3.2.a). These activities are expected to operate out of numerous FOBs in the training area, normally in the vicinity of the Buffalo and Fox drop zones (DZs). While the training areas themselves are not defined SUA, interactions with GA are less likely to occur in training areas than in the VFR corridors because a majority of GA traffic follow VFR corridors. Figure 3.2.a also shows that Restricted Areas (R-2202B, R-2202C, R-2202A, and R-2202C) cover most of the DTA, thus limiting GA use and requiring GA aircraft allowed to transit the areas to communicate with controllers. Therefore, increased USARAK activity levels in these training areas are not likely to increase interaction with civilian aircraft. Continuation of the airspace management policies and coordination practices described in

Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Implementation of Alternative 2 would not change the airspace categories and policies, and would not further restrict civilian access to airspace resources.

Implementation of Alternative 2 would increase activity levels at Allen AAF and associated training corridors. Because airspace standards would continue to be maintained, the potential impacts resulting from implementation of Alternative 2 on safety would be less than significant.

There would be no change in the implementation of airspace management policies and coordination practices described in Subsection 3.2.1.1; therefore, no impact to predictability would result. Implementation of Alternative 2 would not change the airspace categories and, therefore, no impacts to accessibility would result.

4.2.2.3 Alternative 3: Combat Aviation Brigade

4.2.2.3.1 Aviation Personnel

Under Alternative 3, additional military aviation personnel would be stationed at FWA, FRA, and Eielson AFB. The effects of the additional military training conducted by the additional personnel are addressed in Subsection 4.2.2.3.4.

4.2.2.3.2 Aviation Assets

Alternative 3, establishment of a CAB, would introduce 84 additional aircraft. As part of the new organization, 72 USARAK helicopters would be based at FWA, 20 at FRA, and 24 at Eielson AFB, compared to at total of 32 helicopters at FWA under the No Action alternative. These aircraft would include medium- and heavy-lift helicopters, and combat-scout helicopters. The effects of the additional military training associated with these additional assets are addressed in Subsection 4.2.2.3.4.

4.2.2.3.3 Facilities Construction and Demolition

Under Alternative 3, construction and demolition would only occur at FWA. The effects of the proposed construction and demolition would not affect airspace management.

4.2.2.3.4 Military Training

Establishment of a CAB under Alternative 3 would involve increased aviation training requirements for USARAK. Under this alternative, the number of USARAK helicopters would increase from 32 to 116, generating 15,912 annual landings and takeoffs, more than twice as many operations as under the No Action alternative. These aircraft would include medium- and heavy-lift helicopters, combat-scout helicopters, and attack-aviation helicopters. USARAK aircraft would be distributed among several airfields, consisting of about 62 percent at Ladd AAF (FWA), 17 percent at FRA, and 21 percent at Eielson AFB. In addition, the Army National Guard would continue to conduct 4,800 takeoffs and landings at FRA. Table 4.2.d shows the distribution of helicopter activity, including the activity of the Army National Guard aircraft at FRA.

TABLE 4.2.d
Alternative 3: Combat Aviation Brigade—Proposed Based Helicopters and Airfield Activity
USARAK Aviation EIS

		Proposed Helicopter Operations[a]					
	Proposed Based	Average Day			Average Month	Peak Day	Annual
	Helicopters	Day	Night	Total	Total	Total[b]	Total
Fort Richardson – Bryant AAF[c]							
Chinook CH-47	0	2.1	0.7	2.8	56	48	672
Blackhawk UH-60/HH-60	20	27.8	9.3	37.1	743	80	8,920
Subtotals	**20**	**30.0**	**10.0**	**40.0**	**799**	**128**	**9,592**
Fort Wainwright – Ladd AAF[d]							
Chinook CH-47	12	2.2	0.6	2.8	56	24	672
Kiowa OH-58D	30	15.0	5.0	20.0	400	120	4,800
Blackhawk UH-60/HH-60	30	14.0	4.7	18.8	375	78	4,500
Subtotals	**72**	**31.3**	**10.3**	**41.6**	**831**	**222**	**9,972**
Donnelly Training Area – Allen AAF[e]							
Chinook CH-47	0	0.3	01	0.4	8	3.4	96
Blackhawk UH-60	0	0.3	0.1	0.3	7	1.5	92
Subtotals	**0**	**0.6**	**0.2**	**0.7**	**15**	**4.9**	**188**
Eielson AFB[f]							
Apache AH-64	24	3.0	1.0	4.0	80	**NA**[g]	**960**
Grand Total	**116**	**64.8**	**21.5**	**86.3**	**1,725**	**355**	**20,712**

Notes and Data Sources:
[a] An operation is either one takeoff or one landing. Annual estimates based on the assumption that 1 year represents 12 average months; 1 average month equals 20 "average" days. Note that the average day represents a typical flying day, not an annual average day. Values rounded to nearest tenth decimal place or whole number.
[b] Assumes that a peak day would coincide with one of the five anticipated training exercises conducted in support of the airborne brigade (Reid, 2006).
[c] Includes 4,800 annual UH-60 operations by the assigned Army National Guard unit.
[d] Assumed to experience the same number of operations per aircraft as in the Aviation Task Force alternative. See Table 4.2.c.
[e] Reid, 2006.
[f] Based on operational estimates provided by USARAK.
[g] NA = Not Available

The following analysis evaluates the potential effects of Alternative 3 on the airfields, corridors, and training facilities that comprise the airspace resources at FWA and Eielson AFB, FRA, and the DTA. For each of the airspace resources, the analysis considers the effect of the alternative with respect to the three evaluation criteria described in Subsection 4.2.1: safety, predictability, and accessibility.

Fort Wainwright and Eielson AFB

As in Alternative 2, this alternative would involve stationing 40 additional helicopters at FWA upon establishment of a CAB. This alternative would also station 24 USARAK helicopters at Eielson AFB as shown in Table 4.2.d. Within the FWA and Eielson AFB area, USARAK helicopters would travel from Ladd AAF and Eielson AFB to YTA and TFTA via the flight corridors shown in Figure 3.2.a. This alternative would have the following effects in the airfields, corridors, and facilities in this airspace.

- **Airfields.** Under Alternatives 2 and 3, increased USARAK helicopter activity at Ladd AAF would be the same (see Tables 4.2.c and 4.2.d). Under Alternative 3, four USARAK helicopter landings and takeoffs would be added at Eielson AFB on an average day. At both Ladd AAF and Eielson AFB, the additional operations would be conducted at a military airfield not open to civilian air traffic and, therefore, would not increase interactions with GA users. Adding four USARAK helicopter landings and takeoffs on an average day would not prevent the tower from maintaining the standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace

surfaces. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of this alternative would increase the number of aircraft that could be airborne at any one time but would not limit access to local airports. Additionally, since neither Ladd AAF nor Eielson AFB are used by civilian aircraft, increased activity at these airfields would not deny civilian users access to aviation facilities or airspace resources.

- **Corridors.** The CAB would also increase the volume of USARAK helicopters transiting between the training areas, Ladd AAF, and Eielson AFB using the helicopter flight corridors shown in Figure 3.2.a. Additional helicopter flight corridors near Eielson AFB would be used under Alternative 3 as compared to Alternative 2. While these established corridors cross the VFR corridors in several locations, a large percentage of the area is located within Class D Airspace and would be managed by the ATC towers of Ladd AAF and Eielson AFB. The addition helicopter operations would increase traffic levels in the VFR Corridor and other unrestricted airspace, but not to the degree that pilots would be unable to see and avoid other aircraft. Implementation of this alternative would not alter the typical flight patterns in this area. As described earlier under Alternative 2, continuation of the proven airspace management policies and practices described in Subsection 3.2.1.1 would assist military and civilian pilots in maintaining separation standards. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations or increase the variability of typical flight operations. Continuation of these policies and coordination practices would also enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. By adhering to these policies and practices, USARAK operations would continue to allow civilian access to airspace and airports as activity levels increase.

- **Training Facilities.** Implementation of Alternative 3 would result in increased activity and use of TFTA and YTA (see Figures 2.3.b, 2.3.c, and 3.2.a). It is likely that the helicopters based at Eielson AFB would make most use of the YTA, which is immediately adjacent to the airfield (see Figure 3.2.a) The addition of 27 operations per day at Ladd AAF and four daily helicopter operations at Eielson AFB would increase activity levels, but would not otherwise increase the complexity of flight patterns in and around the training areas. This increase in traffic levels would not prevent pilots from seeing and avoiding other aircraft. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of Alternative 3 would not change the airspace categories, and GA users would continue to be allowed to enter Restricted Areas upon being granted permission; therefore, there would be no impacts to accessibility of GA users in training areas.

The requirements and frequency of aerial reconnaissance training would be similar to the No Action alternative. Training would only occur in Fairbanks and North Pole, and would include all types of USARAK helicopters stationed at FWA under Alternative 3. USARAK would continue its process of public notification and coordination in advance of urban reconnaissance training events.

Implementation of Alternative 3 would increase activity levels at Ladd AAF and Eielson AFB and associated training corridors. Because airspace standards would continue to be maintained, the potential impacts resulting from implementation of Alternative 3 on safety would be less than significant.

There would be no change in the implementation of airspace management policies and coordination practices described in Subsection 3.2.1.1; therefore, no impact to predictability would result. Implementation of Alternative 3 would not change the airspace categories and, therefore, no impacts to accessibility would result.

Fort Richardson

Unlike Alternatives 1 and 2, establishment of the CAB would increase training flights at FRA. Most of the training activity associated with these aircraft would occur in the Eagle River Flats (ERF) impact area (IA) located north of Bryant AAF. In addition, helicopters from Ladd AAF would travel to FRA (Bryant AAF and ERF IA) for one annual training exercise via established flight corridors as shown in Figure 2.2.a. This alternative would have the following effects in the airfields, corridors, and facilities in this airspace.

- **Airfields.** On an average day, USARAK aircraft would generate about 20 landings and takeoffs at Bryant AAF as part of the 40 average-day operations shown in Table 4.2.d, which includes ongoing Army National Guard activity. The CAB would also conduct a one-time, 14-day duration, annual training event at FRA. The event would involve 10 Blackhawk and six Chinook helicopters, each of which would conduct eight door-gunnery training operations per day. The 16 helicopters would travel between FWA and FRA once annually (once from FWA to FRA and once from FRA back to FWA). During the annual training exercise, the 16 USARAK aircraft would generate about 128 operations per day. This increase in activity would not prevent pilots from maintaining the separation in the airfield environment. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Bryant AAF is not used by civilian aircraft, so increased activity at this airfield would not deny civilian users access to aviation facilities.

- **Corridors.** Except for one annual training event, USARAK helicopter traffic between FRA and FWA traveling through the Class E airspace would not increase materially with establishment of the CAB. At the start and end of the training event, as many as 16 USARAK helicopters would transit between Allen AAF and Bryant AAF using the helicopter flight route shown in Figure 2.2.a. Each of the 16 aircraft involved in the exercise would conduct four flights (or eight operations) per day at FRA. During the periods, daily activity at FRA would increase to about 128 operations per day. Most of

this activity would occur within the FRA Training Area, primarily within Restricted Airspace associated with the ERF IA (see Figure 2.2.c). Outside of the Restricted Area, military and civilian aircraft could interact. On an average day, only a portion of the estimated 20 USARAK takeoffs at Bryant AAF would generate activity in areas accessible to civilian aircraft. Continuation of the proven airspace management policies and practices described in Subsection 3.2.1.1 would assist military and civilian pilots in maintaining separation standards. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of these policies and coordination practices would enable other airspace users to predict upcoming USARAK activities, plan their own flights accordingly, and ensure that increased use of helicopter flight routes between the airfields and the training areas would not deny civilian access to airspace or airports.

- **Training Facilities.** Implementation of Alternative 3 would result in increased activity and use of FRA, primarily in the ERF IA (see Figures 2.3.e and 3.2.a). The northern portion of this training, which includes the ERF IA, is covered by a Restricted Area (R-2203G), which effectively limits civilian access. Increased USARAK activity levels in this training area, therefore, are unlikely to increase interaction with civilian aircraft. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of Alternative 3 would not change the airspace categories and policies, and would not further restrict civilian access to airspace resources.

Implementation of Alternative 3 would increase activity levels at FRA and associated training corridors. Because airspace standards would continue to be maintained, the potential impacts resulting from implementation of Alternative 3 on safety would be less than significant.

There would be no change in the implementation of airspace management policies and coordination practices described in Subsection 3.2.1.1; therefore, no impact to predictability would result. Implementation of Alternative 3 would not change the airspace categories and, therefore, no impacts to accessibility would result.

Donnelly Training Area

Establishment of the CAB would increase training flights in the DTA. Helicopters from Ladd AAF and Eielson AFB would travel to DTA (and Allen AAF) via established flight corridors as shown in Figures 3.2.a and 3.2.b. Increased training would also occur in the DTA. This alternative would have the following effects in the airfields, corridors, and facilities in this airspace.

- **Airfields.** As under Alternative 2, most of the additional activity would be staged out of numerous forward operating bases in restricted airspace. Consequently, USARAK helicopter use of Allen AAF would be minimal (see Table 4.2.d). This minimal increase in activity would not prevent the tower from maintaining the standards used to separate multiple aircraft, aircraft and physical structures, and aircraft and airspace surfaces.

Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations, or increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Allen AAF is not used by civilian aircraft, so increased activity at this airfield would not deny civilian users access to aviation facilities.

- **Corridors.** This area would experience an increase in USARAK helicopters transiting between FWA, Eielson AFB, and DTA in established flight corridors as noted above. The Birch, Alaska Highway, and Richardson Highway VFR Corridors are located in the vicinity of helicopter flight corridors near DTA, south of TFTA (see Figures 3.2.a and 3.2.b). As noted for Alternative 2, the greatest opportunity for interaction with GA would occur where the helicopter flight routes cross the VFR corridors at the western end of the Birch VFR Corridor, the northern end and near the middle of the Richardson Highway VFR Corridor, and within the Quartz Lake MOA and Class D airspace for Allen AAF. Assuming that each of the 31 additional average daily USARAK helicopter operations at Ladd AAF and Eielson AFB generates a flight along these routes, the resultant increase in volume of air traffic would be minor and not prevent pilots from maintaining separation standards in these areas. Implementation of this alternative would not decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations or increase the variability of typical flight operations. Continuation of the proven airspace management policies and practices described in Subsection 3.2.1.1 would assist military and civilian pilots in maintaining separation standards, enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly, and ensure that increased use of helicopter flight routes between the airfields and the training areas would not deny civilian access to airspace or airports.

- **Training Facilities.** Implementation of Alternative 3 would result in increased activity and use of DTA. The Aviation Task Force is expected to conduct door gunnery and tactical training in the DTA (see Figures 2.3.c and 3.2.a). These activities are expected to operate out of numerous FOBs in the training area, normally in the vicinity of the Buffalo and Fox DZs. While the training areas themselves are not defined SUA, interactions with GA are less likely to occur in training areas than in the VFR corridors. As noted above for Alternative 2, Restricted Areas cover most of the DTA, limiting potential interaction with civilian aircraft. Implementation of this alternative would neither decrease the notice given to civilian airspace users about upcoming changes in USARAK flight operations nor increase the variability of typical flight operations. Continuation of the airspace management policies and coordination practices described in Subsection 3.2.1.1 would enable other airspace users to predict upcoming USARAK activities and plan their own flights accordingly. Implementation of this alternative would not expand Restricted Areas or other SUA. Implementation of Alternative 3 would not change the airspace categories and policies, and would not restrict civilian access to airspace resources.

Implementation of Alternative 3 would increase activity levels at DTA and associated training corridors. Because airspace standards would continue to be maintained, the

potential impacts resulting from implementation of Alternative 3 on safety would be less than significant.

There would be no change in the implementation of airspace management policies and coordination practices described in Subsection 3.2.1.1; therefore, no impact to predictability would result. Implementation of Alternative 3 would not change the airspace categories and, therefore, no impacts to accessibility would result.

4.2.2.4 Summary of Impacts

The potential impacts resulting from any of the alternatives are less than significant. The alternatives under consideration would not change the structure of the airspace or increase the amount of special use airspace. Therefore, the potential impacts are limited to the effect of increased USARAK helicopter activity in public airspace. Table 4.2.e presents a comparative summary of airfield operations by alternative. These characteristics provide context for the comparative summary of impacts by alternative in Table 4.2.f.

TABLE 4.2.e
Comparative Summary of USARAK Airfield Operations by Alternative for Airspace Management
USARAK Aviation EIS

Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
FWA – Ladd AAF			
Based Helicopters	32	72	72
Annual Airfield Operations	3,672	9,972	9,972
Average Day Airfield Operations	15.3	41.6	41.6
Peak Day Airfield Operations	36.1	222.0	222.0
FRA – Bryant AAF			
Based Helicopters	0	0	20
Annual Airfield Operations	0	0	4,792
Average Day Airfield Operations	0	0	20
Peak Day Airfield Operations	0	0	64.0
Eielson AFB			
Based Helicopters	0	0	24
Annual Airfield Operations	0	0	960
Average Day Airfield Operations	0	0	4.0
Peak Day Airfield Operations	0	0	NA
DTA – Allen AAF			
Based Helicopters	0	0	0
Annual Airfield Operations	188	188	188
Average Day Airfield Operations	0.7	0.7	0.7
Peak Day Airfield Operations	1.4	4.9	4.9

Notes:
NA = data is not available

TABLE 4.2.f
Comparative Summary of Impacts by Alternative for Airspace Management
USARAK Aviation EIS

Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Safety	No change from existing conditions; therefore, no impact.	Increased potential for interaction with GA. While these increases would occur at Ladd AAF and within the TFTA and YTA, interaction with GA is less likely in these areas than in the VFR corridors due to airspace management and SUA regulations. The greatest likelihood for interaction with GA would be where the helicopter flight corridors cross the VFR corridors used by GA, such as the Birch VFR Corridor near the southern end of the TFTA, and the Richardson Highway VFR Corridor south and east of Allen AAF and DTA. This alternative would not increase the nature or complexity of flight operations in airspace jointly used with civilian aircraft; therefore, the impact would be less than significant.	Same as Alternative 2. Potential interactions with GA could also result from helicopters transiting between FWA and FRA during the annual training event. While infrequent, the event will require passage through high air traffic areas near Anchorage, as well as through areas that are known to result in concentrations of aircraft during inclement weather due to terrain (such as Windy Pass and Isabella Pass). This alternative would not increase the nature or complexity of flight operations in airspace jointly used with civilian aircraft; therefore, the impact would be less than significant.
Predictability	No change from existing conditions; therefore, no impact.	While there would be increased frequency and intensity of training activities, it would occur in areas that have established notification and airspace planning procedures. Continuation of existing communications techniques would result in no impacts to predictability.	Same as Alternative 2
Accessibility	No change from existing conditions; therefore, no impact.	No change to airspace structure, including restricted areas; therefore, no impacts to accessibility would result. Increased activity would continue to be addressed through existing coordination procedures.	Same as Alternative 2

4.2.3 Mitigation

As a means of mitigating potential impacts, USARAK will continue its program of coordination with local civilian aviation interests and the USAF to reduce potential conflicts in corridors used heavily by both military and civilian air traffic. Specific measures include the following:

- Use of the NOTAM system to alert civil and other military users of upcoming events, such as training exercises.
- Participation in ACMAC meetings, a forum for discussing aviation issues with the USAF and civilian aviation interests.
- Continue to advise airspace users over FREQ (FM) 38.30 regarding operational ranges and areas to avoid. Evaluate participation in the USAF SUAIS program.

- Conduct quarterly USARAK Aviation Safety Standard Council meetings with the FAA, USAF, and GA representatives to alert the civilian and military aviation communities about upcoming exercises and other periods of intense training activity.

In addition, USARAK operations in and outside of training areas will continue to be governed by existing policies and doctrine, including:

- Army Regulation (AR) 95-1, *Aviation Flight Regulations*, April 2004 (U.S. Department of the Army, 2008a)
- USARAK Airborne Standing Operating Procedures (ASOP), April 2003 (USARAK, 2003a)
- USARAK 350-2, *Range Regulation*, July 2002 (U.S. Department of the Army, 2002)
- Army Pamphlet 385-63 and AR 385-63, which govern safety on ranges including aviation training and gunnery (U.S. Department of the Army, 2003)

4.3 Cultural and Visual Resources

Following is a discussion of the potential effects to cultural and visual resources from each of the Proposed Action alternatives considered in the EIS.

Because the scope of cultural and visual resources is limited to the FWA AF as described in Subsection 3.3.2 (see Figure 3.3.a), this impacts assessment is also limited to the AF with the potential for impacts from the Proposed Action alternatives. No adverse impacts are anticipated to archaeological or tribal resources from any of the alternatives, which was explained in Section 3.3.2. Stationing actions under Alternative 3 at FRA and Eielson AFB would involve use of existing facilities. No new construction or renovation is proposed at FRA or Eielson AFB; therefore, there are no adverse impacts to either of these installations and further discussion is not warranted.

4.3.1 Significance Criteria

The evaluation criteria for cultural resources include historic integrity and visual and auditory effects (Table 4.3.a). These topics form the basis of the criteria used to assess the significance of potential impacts of the Proposed Action alternatives on cultural resources. The National Register of Historic Places (NRHP) criteria for historic significance and historic integrity are described in detail in Subsection 4.3.1.1.

A clear distinction is made in this EIS between visual impacts that relate specifically to cultural resources and impacts to FWA visual resources in general. Visual impacts to cultural resources are those impacts to the viewshed of the National Historic Landmark (NHL) district or Cold War Historic District that might affect the integrity of association, setting, or feeling of these historic districts (see Subsection 4.3.1.1 or a discussion of integrity of historic resources). Visual impacts in general (i.e., those not explicitly linked to issues of historic integrity) involve disturbances to the existing FWA viewshed, such as blocking views from or to certain viewpoints or diminishing their aesthetic qualities. Table 4.3.a refers only to the visual significance criteria and effects in relation to cultural resources. General visual effects are discussed separately in this section and in Section 3.3. Similarly, auditory impacts listed in Table 4.3.a are those noise impacts that relate specifically to the

integrity of the historic districts. Noise impacts in general (i.e., those not explicitly linked to cultural and historic resources) are separately discussed in Sections 3.4 and 4.4.

TABLE 4.3.a
Cultural Resources Significance Criteria
USARAK Aviation EIS

	Criteria for Determining Significant Impact
Topic	**Adverse Effect**
Historic Integrity	Physical destruction or damage to all or part of the historic resources within the NHL district.
	Introduction of new elements into the NHL district that substantially diminish the integrity of the NHL's significant historic features.
Visual Impacts to Cultural and Historic Resources	Physical destruction or damage to all or part of the historic resources within the NHL district.
	Introduction of visual elements into the NHL district that substantially diminish the integrity of the NHL's significant historic features.
Auditory Impacts to Cultural and Historic Resources	Introduction of auditory elements into the NHL district that substantially diminish the integrity of the NHL's significant historic features. Criteria for assessing auditory impacts to historic resources are contained in footnote "a" to Table 4.3.c.

4.3.1.1 Cultural Resources

Historic integrity is a critical component of a historic resource. The historic integrity of a building is defined as the ability of the building to convey its historic significance. Based on the eligibility criteria for the NRHP, a building must be related to a significant historic event (Criterion A), person (Criterion B), or architectural style (Criterion C), or be able to provide information that adds to our understanding of history (Criterion D). To be considered as having historic significance, in addition to the four criteria for the NRHP, a building must have all or some of the seven elements of integrity that help to convey its history: setting, location, association, materials, workmanship, design, and feeling.

4.3.1.2 Visual Resources

The visual resource criteria determine the impacts of new construction to the NHL. The visual resource criteria focus on the existing NHL historic district and its character-defining elements of setting, feeling, design (including scale and massing), and association. The visual impacts of new construction, either in scale or in number, could be such that the NHL no longer retains its integrity of a setting as a World War II (WWII) military installation, original design, feeling, or association, including changes to construction materials and scale associated with WWII.

In addition to the criteria outlined above, the U.S. Army Corps of Engineers (USACE) evaluation criteria, *Visual Resources Assessment Procedure for U.S. Army Corps of Engineers* (USACE, 1988), were used to determine the degree of impact from each alternative on the existing conditions of the three viewpoints that were initially established (Figure 3.3.b). The evaluation criteria assessed whether an alternative would have a significant impact on visual resources in terms of whether the alternative affected the viewshed or vista scale or degree, a sensitive receptor, or a new physical feature (see Table 4.3.b).

TABLE 4.3.b
Visual Resources Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Viewshed or Vista Scale or Degree	Permanently alter a site so that a sensitive viewing point or vista is obstructed or adversely affected, or if the scale or degree of change appears as a substantial, obvious, or disharmonious modification of the overall view.
Sensitive Receptor	Prevent or substantially impair the view from a sensitive viewpoint for the duration of project construction.
New Physical Feature	Introduce physical features that are substantially out of character with adjacent developed areas.

4.3.1.3 Auditory Impacts

Auditory criteria relate to the impacts of new uses within the NHL and the surrounding areas that could impact the setting, feeling, and association of the NHL. Through the decades, the NHL has had numerous military missions, with increases and decreases in use and new larger, smaller, and louder aircraft. If new missions of the Proposed Action alternatives greatly increase the historic noise levels of the Post's flight line, these increases could be considered an adverse effect to the setting, feeling, and association of the NHL.

4.3.2 Environmental Consequences for Cultural and Visual Resources

Environmental consequences for cultural and visual resources are presented in this section for all three alternatives evaluated in this EIS.

4.3.2.1 Alternative 1: No Action

Under the No Action alternative, USARAK's existing aviation personnel, assets, plans for construction and demolition, and military training would remain unchanged from existing conditions. If the No Action alternative is selected, the long-term sustainability of the Army's aviation mission at FWA may be questionable, which could result in the neglect and deterioration of buildings associated with the NHL.

Because the numbers of Soldiers, helicopters, and takeoffs and landings would remain the same (discussed further in subsection that follow), existing auditory effects to the NHL and Cold War Historic District would remain the same. There would be no change in these impacts from existing conditions.

4.3.2.1.1 Aviation Personnel

Under the No Action alternative, the existing number of USARAK Soldiers in Alaska engaged in aviation activities would remain the same. Existing aviation personnel would continue to use current FWA barracks, hangars, parking areas, administration buildings, the Ladd AAF flight line, training locations, and transportation corridors.

4.3.2.1.2 Aviation Assets

Under the No Action alternative, the proposal to increase the Army's aviation assets in Alaska would not be implemented. No additional helicopters would be permanently stationed in Alaska.

4.3.2.1.3 Facility Construction and Demolition

Under the No Action alternative, no demolition or new construction to support aviation would occur. Because no demolition or new construction would occur, there would be no

disturbances to the historic integrity of the NHL district or Cold War Historic District resulting from infill construction.

Figures 4.3.a, 4.3.b, and 4.3.c show the view that would result from each of three viewpoints under the No Action alternative. No changes to the visual integrity of the NHL or the Cold War Historic District from the three viewpoints would occur because the views are the same as the existing conditions. There would be no change in these impacts from existing conditions.

All current buildings and structures currently in use would remain in use. However, an indirect adverse effect of the No Action alternative would be the potential loss of sustainability of the military aviation mission at FWA. Termination of the FWA's military aviation mission could pose a threat to Hangars 2 and 3 and other NHL resources, which are best maintained when they provide support to military aviation operations. Should the mission be terminated, the impact to the NHL could be significant.

4.3.2.1.4 Military Training

Although no additional Soldiers and helicopters would be permanently stationed in Alaska, and no new facilities would be constructed, existing aviation assets would continue to use current training locations and transportation corridors, and USARAK lands would continue to support existing training. The support facilities, ranges, and training would remain unchanged (USARAK, 2004; USARAK, 2005). USARAK would continue to conduct mission-sustaining training activities, but integrated aviation support training to USARAK's BCTs would be limited. All existing conditions associated with military training would remain unchanged; therefore, existing conditions relating to the historic integrity within the NHL and the Cold War Historic District would continue. There would be no change in these impacts from existing conditions.

4.3.2.2 Alternative 2: Aviation Task Force

Under Alternative 2, USARAK would increase its number of aviation personnel and aviation assets at FWA. New facilities would be constructed and three facilities would be demolished to accommodate the expanded aviation unit. Alternative 2 would also increase military training on existing USARAK training lands at FWA and DTA.

In addition to the analysis for Alternative 2 provided in the following subsections, Subsection 4.3.2.4 discusses impacts that would occur to the NHL and Cold War Historic District under Alternative 2. Subsection 4.3.2.4 also includes a discussion of USARAK's obligations for Section 110 of the National Historic Preservation Act (NHPA) for Alternative 2.

4.3.2.2.1 Aviation Personnel

Alternative 2 would convert the existing USARAK aviation contingent into a Task Force by stationing additional Soldiers at FWA. New construction and demolition associated with additional Soldiers and expanded mission activities are addressed in Subsections 4.3.2.2.3 and 4.3.2.2.4 that follow; no additional impact from existing conditions would be expected from increased use of existing historic properties.

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FIGURE 4.3.a
Existing Panoramic Viewpoint 1 from North Side of Ladd Field
USARAK Aviation EIS

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FIGURE 4.3.b
Existing Panoramic Viewpoint 2 from Southwest Side of Ladd Field
USARAK Aviation EIS

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FIGURE 4.3.c
Existing Viewpoint 3 from South Side of Ladd Field
USARAK Aviation EIS

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4.3.2.2.2 Aviation Assets

Alternative 2 would augment the existing USARAK aviation assets as described in Subsection 2.5.2 of this EIS. No impact to cultural or visual resources would be expected directly from the increased assets, and the impacts associated with increased military training with those assets are described in Subsection 4.3.2.2.4.

4.3.2.2.3 Facilities Construction and Demolition

Assessing the impact of facilities construction and demolition focused on the effects of building new facilities within the NHL district boundary (infill) and demolishing existing facilities; constructing two new hangars within the viewshed of the NHL; and potential changes in the use of Hangars 2 and 3 within the NHL district. New construction of buildings and structures within the boundaries of the Ladd AAF NHL district would result in adverse effects to the landmark. The impact would be significant.

As noted above, potential effects to the Cold War Historic District also were evaluated because the NHL and Cold War Historic District boundaries significantly overlap (see Subsection 3.3.2 and Figure 3.3.a). Under NRHP criteria for historic integrity, it was concluded that the impact to the NHL would be significant. The impacts to the Cold War Historic District are less than significant.

Alternative 2 would result in the construction of new buildings, removal of existing buildings, and the addition of other facilities (parking, storage, wash apron, etc.) into the viewed landscape. Approximately 2.4 million square feet (55 acres) of new infill facilities would be built, including barracks, hangars, helicopter and vehicle parking, and support facilities (see Figure 2.5.b). A majority of new construction would be south of the flight line and within the NHL district. This new infill construction would decrease and alter the character of the open space within the NHL. The new hangars, especially the Chinook Hangars, would extend the built environment northward, encroaching on the open space of the airfield.

The proposed Chinook and Kiowa Hangars would be out of scale relative to many of the adjacent contributing buildings. The footprints of the proposed hangars would exceed 100,000 square feet and the hangars would be approximately 70 feet high. They would both be larger than Hangars 2 and 3, each of which has a footprint of approximately 30,400 square feet and a maximum height of 57 feet. In addition to scale, the two proposed hangars would differ in design compared to the historic hangars, although designs for the new hangars are not yet available. However, measures are proposed to mitigate the adverse effect to the NHL through use of sympathetic design by considering the historic character of the NHL during the new hangar design process (see Subsection 4.3.3). The presence of the two proposed hangars would result in adverse effects to the historic integrity of the southwestern part of the NHL district. The integrity of design, setting, feeling, and association that presently defines the NHL would be adversely affected in the absence of appropriate mitigation. The impact would be significant.

In addition to introducing new structures that would be larger in scale than existing facilities, the two proposed hangars would alter existing views within the NHL. The Chinook Hangar would be constructed approximately 200 feet east of Hangar 3, and would extend approximately 500 feet beyond the north face of Hangar 3 to the edge of the South

Taxiway. Its presence would form a visual barrier that would block existing views in some areas of the NHL. When looking toward Hangars 2 and 3 from Hangar 1 (see Figure 4.3.d), all of Hangar 3 would be blocked from view by the proposed Chinook Hangar as would approximately 25 percent of Hangar 2. The view from Hangars 2 and 3 toward Hangar 1 would likewise be affected. Views of Hangar 1 from Hangar 3 would be completely blocked by the proposed Chinook Hangar, which would also partially obscure views from Hangar 2. The impact would be significant.

The proposed Kiowa Hangar, which would be constructed approximately 1,500 feet east of Hangar 3, as well as the warm storage facility, would also introduce large-scale structures within the NHL district. The Kiowa Hangar would not block views from and to the southwest part of the NHL district to the same degree as the proposed Chinook Hangar. However, its scale and location paralleling the South Taxiway would change the appearance of the NHL district as much as the proposed Chinook Hangar, and it would block views to the north side of the NHL from areas south of it. The presence of both proposed hangars would change the historic integrity of setting, feeling, and association of the NHL district and would have an adverse visual impact. Figures 4.3.e and 4.3.f provide simulations of the anticipated views from Viewpoints 2 and 3 (see Figure 3.3.b for viewpoint locations) under Alternative 2. The overall impact to the viewsheds from infill construction would be significant.

Compared to the two proposed hangars, the other new facilities proposed under Alternative 2 would have little impact on the NHL. The new aircraft parts storage building and the new Company Operations Facility (COF) would be of a scale and design that would be similar to many of the existing historic buildings in the NHL and would not compromise the NHL's existing viewshed. Mitigation measures are proposed in Subsection 4.3.3 to minimize and mitigate the adverse effects to the NHL. The FWA *Installation Design Guide* (IDG) (United States Army Garrison [USAG]-AK 2006), along with other guidance and processes, would help USARAK to address such issues as facility siting, scale, and sympathetic design.

Other new buildings and structures that would be built within the NHL would include a warm storage facility (for Kiowa helicopters), a fire deluge system (new well), a building for unit-level operations and classroom training, and a new aircraft parts storage building. A new barracks would be built adjacent to the Cold War Historic District, east of a series of Cold War-era barracks. A more complete list of new buildings to be constructed under Alternative 2 is shown in Table 2.5.d. Designs for the new buildings are not available, but all would likely be utilitarian in appearance and not inconsistent with the wide variety of building types, styles, and scales found throughout most of FWA. Mitigation measures are proposed in Subsection 4.3.3 to minimize and mitigate such effects to the NHL. Therefore, the new "non-hangar" buildings would not have an adverse impact on the historic integrity of the NHL or the Cold War Historic District. The impact would be less than significant.

In addition to the new buildings near the South Taxiway that would be constructed within the NHL under Alternative 2, new outdoor parking areas for helicopters would be constructed. The southernmost parking area would be situated north of Hangars 2 and 3 and immediately west of the proposed Chinook Hangar, and would be used for parking Chinooks. Part of this area is currently used for helicopter parking. Because the area for the

FIGURE 4.3.d
Simulation of Panoramic Viewpoint 1 with Alternatives 2 and 3 from North Side of Ladd Field
USARAK Aviation EIS

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FIGURE 4.3.e
Simulation of Panoramic Viewpoint 2 with Alternatives 2 and 3 from Southwest Side of Ladd Field
USARAK Aviation EIS

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FIGURE 4.3.f
Simulation of Panoramic Viewpoint 3 with
Alternatives 2 and 3 from South Side of Ladd Field
USARAK Aviation EIS

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potential outdoor parking is already paved and used for helicopter parking, the introduction of a new, more formalized area and the presence of Chinook helicopters would not alter the historic integrity of the southwestern part of the NHL and would not be an adverse impact on the NHL. The impact would be less than significant.

A parking area for Kiowas would be constructed on either side of the proposed Kiowa Hangar, east of Hangars 2 and 3 and the proposed Chinook Hangar. The parking area and presence of parked Kiowas would not have an adverse impact on the NHL. Helicopter parking for Blackhawks would be located at the east end of the South Taxiway near Hangar 6 and the combined Hangars 7 and 8. As with the other potential helicopter parking area, these parking areas would not alter the historic uses or integrity of the NHL and would not have an adverse impact on the NHL. The impact would be less than significant.

In addition to constructing new facilities within the NHL, Alternative 2 would include demolishing structures. Under Alternative 2, the following three existing structures would be demolished: Building 3475 (Shipping/Receiving and Administrative Facility), Building 3477 (Vehicle Maintenance Shop), and Building 3011 (Water Treatment Building). No other demolition is proposed other than these properties at FWA.

None of the three buildings to be demolished is listed on, or considered eligible for, the NRHP. Buildings 3475 and 3477 lie outside the boundaries of both the Ladd AAF NHL and the Cold War Historic District. Neither building is considered individually eligible for the NRHP under any criterion. Building 3011, constructed in 1949, lies within the boundary of the Cold War Historic District but is a noncontributing element to the district. Demolition of these three structures would not result in any direct or adverse impacts to any historic structures or districts and would not change the historic character of the NHL. The impact would be less than significant.

Alternative 2 would also result in some new facilities being constructed at FWA outside of the NHL or Cold War Historic District. These would include new outdoor parking and storage areas and a recreational vehicle parking area replacement. The new construction would be similar in size, massing, and materials to many of the existing structures in the Cold War Historic District and the areas for proposed new construction. These new or relocated facilities would have no adverse effect on the viewed environment and to the visual quality of the NHL or Cold War Historic District. The impact would be less than significant.

Although it would not be as visible as new buildings, one of the most visible additions to the viewed landscape associated with all of the alternatives would be security fencing around the airfield. The chain-link fencing would be approximately 12 feet high and would be topped with security wire such as rolls of razor wire/concertina wire. Although the chain-link fencing would generally allow views of the NHL and Cold War Historic District, it would introduce a new element to areas near it from which it could be seen. The fence would not be out of character with a military installation and historically, the airfield included a fence. Fencing would not result in an adverse effect under the three impact criteria described previously in Subsection 4.3.1.2. The impact would be less than significant.

Construction at FWA would require the use of heavy machinery throughout the site for site preparation, including vegetation clearing and site grading for building foundations, as well as material transport and delivery. Construction-related ground disturbance would not likely result in direct impacts to archaeological resources because the location of the new facilities would be in areas that have a low probability for archaeological resources and have already been disturbed by military activity. Although considered unlikely, potential impacts to archaeological resources through inadvertent discovery, however, could occur during construction. Mitigation is proposed in Subsection 4.3.3.6. The impact, should it occur, could be significant.

In addition, digging and pile driving during construction could result in temporary direct effects to historic buildings immediately adjacent to the construction site due to vibration. The effect is less than significant.

Operations and maintenance (O&M) impacts for existing historic facilities that would be used under Alternative 2 would be minimized by established USARAK procedures that protect historic properties during ongoing O&M activities. The impact would be less than significant.

4.3.2.2.4 Military Training

Along with the additional Soldiers, aircraft, and proposed construction and demolition at FWA that would occur under Alternative 2, there would be additional takeoffs and landings at FWA, and additional flights across USARAK training lands in Alaska associated with mission-related training and operations. Because training and operations activities are ongoing, and because the flight corridors and training areas would remain the same under the Proposed Action, the additional takeoffs, landings, and flights represent a continuation of existing land uses and activities, albeit at a greater frequency. The increased frequency of military training would not have an adverse effect on cultural and visual resources under Alternative 2. There would be a benefit of continuing the military aviation mission at FWA under Alternative 2, because these activities would serve to promote continuation of the NHL's historic use.

Auditory impacts to both the NHL and the Cold War Historic District would not be adverse for Alternative 2 as a result of increased military training. The area bounded by the NHL has experienced thousands of takeoffs and landings associated with WWII military missions. During the Cold War, the missions changed, but the flight line and structures in the NHL and the Cold War Historic District continued to be used for aircraft operations. Because the takeoffs and landings associated with Alternative 2 represent a continuation of longstanding activities at FWA, there would not be any changes to the auditory impacts to the NHL and the Cold War Historic District. Additional helicopter use of Ladd AAF would be compatible with the current mission of FWA and its original use as a military airfield. The proposed increase in takeoffs and landings under Alternative 2 would not alter the integrity of the NHL. The impact would be less than significant.

4.3.2.3 Alternative 3: Combat Aviation Brigade

Under Alternative 3, USARAK would increase its number of aviation personnel and aviation assets at FWA, FRA, and Eielson AFB. At FWA only, new facilities would be constructed and three facilities would be demolished to accommodate the expanded

aviation unit. Alternative 3 would also increase military training on existing USARAK training lands at FWA, FRA, and DTA.

In addition to the discussion of impacts for Alternative 3 provided in the following subsections, Subsection 4.3.2.4 provides a summary of impacts that would occur to the NHL and Cold War Historic District under Alternative 3. Subsection 4.3.2.4 also includes a discussion of USARAK's obligations for Section 110 of the NHPA for Alternative 3.

4.3.2.3.1 Aviation Personnel

Alternative 3 would convert the existing USARAK aviation contingent into a CAB (Brigade) by stationing additional Soldiers at FWA, FRA, and Eielson AFB. It is estimated that most (60 percent) of the Brigade would be stationed at FWA, with the remaining Soldiers split evenly between FRA and Eielson AFB. New construction and demolition associated with additional Soldiers and expanded mission activities are addressed in Subsections 4.3.2.3.3 and 4.3.2.3.4 that follow; no additional impact from existing conditions would be expected from increased use of existing historic properties.

4.3.2.3.2 Aviation Assets

Alternative 3 would augment the existing USARAK aviation assets as described in Subsection 2.5.2 of this EIS. No impact to cultural or visual resources would be expected directly from the increased assets, and the impacts associated with increased military training with those assets are described in Subsection 4.3.2.3.4.

4.3.2.3.3 Facilities Construction and Demolition

Alternative 3 would expand the existing USARAK contingent to a CAB (Brigade). New facility construction at FWA would be required to accommodate the increased number of Soldiers stationed at the facility under this alternative. No new construction would occur at FRA or Eielson AFB to support the CAB.

Building demolition and the construction of new barracks, hangars, helicopter and vehicle parking, and support facilities would occur at FWA to accommodate the increased Soldiers, aviation assets, and associated housing needs under Alternative 3 (Figure 2.5.c). Approximately 3.2 million square feet (73 acres) of new construction would occur under this alternative. All construction described in Alternative 2 would be the same for Alternative 3. However, Alternative 3 would also require the construction of additional vehicle parking, headquarters, operational and administrative facilities, barracks, and storage facilities. Alternative 3 also includes the demolition of the same three buildings described in Alternative 2. No construction or demolition is planned at installations other than FWA under Alternative 3, and further discussion of impacts to cultural resources is not warranted because no impacts would be anticipated.

Impacts to the NHL and the Cold War Historic District under Alternative 3 would be the same as those for Alternative 2. Potential construction-related impacts to archaeological resources at FWA under Alternative 3 would be the same as those for Alternative 2.

O&M impacts associated with use of historic properties under Alternative 3 would be the same as those identified for Alternative 2. USARAK has established procedures that protect historic properties during ongoing O&M activities.

New buildings associated with Alternative 3 to be constructed within the NHL boundary would include the two new hangars that are part of Alternative 2. The proposed Chinook and Kiowa Hangars would be built south of the South Taxiway, east of Hangar 3. As is the case with Alternative 2, designs are not yet available for the new hangars under Alternative 3. They would be larger in scale than the existing hangars and would change the scale and character of the southern and western portions of the NHL and Cold War Historic District. However, measures are proposed to mitigate the adverse effect to the NHL through use of sympathetic design that considers the historic character of the NHL during the new hangar design process (see Subsection 4.3.3). The new hangars would have the same visual impacts on the NHL as those described for Alternative 2. The impact would be significant.

Although the hangars would be the most highly visible new buildings at FWA, other buildings and facilities associated with Alternative 3 would also be constructed and would influence the viewed environment, but would have little to no influence on the NHL or Cold War Historic District. Most of the new buildings and facilities would likely be highly utilitarian in appearance and not inconsistent with the variety of building types, styles, and scales found throughout FWA.

Additional new buildings associated with Alternative 3 are shown on Figure 2.5.c. These include two new buildings to be located north of Montgomery Road and within the NHL boundary. They would be a secure storage area and an aviation parts storage building. Several additional new buildings and facilities would be located south of Montgomery Road. Among them would be barracks, various company and brigade headquarters buildings, a vehicle maintenance facility, and new parking areas. South of Alder Avenue would be new brigade headquarters, battalion headquarters, and CAB administration buildings with parking areas located southwest and south of Montgomery Lake.

Although designs for the potential new buildings that are part of Alternative 3 have not been developed, it is assumed that they would be similar in scale and design detail to other buildings at FWA, and would not have a significant impact on visual resources. Measures are proposed to mitigate the adverse effect of infill construction to the NHL through use of sympathetic design that considers the historic character of the NHL during the new building design process (see Subsection 4.3.3). Mitigation measures are provided for infill construction effects in Subsection 4.3.3.1. For buildings other than the two new hangars, the impact to the NHL and Cold War Historic District is not significant.

Alternative 3 would result in some new facilities being constructed at FWA outside of the NHL or Cold War Historic District. These would include new outdoor parking and storage areas and a recreational vehicle parking replacement. These new or relocated facilities would have no adverse effect on the viewed environment and to the visual quality of the NHL or Cold War Historic District. The impact would be less than significant.

Figures 4.3.d, 4.3.e, and 4.3.f show how existing views from three locations would change from implementation of Alternative 3.

Construction at FWA would require the use of heavy machinery throughout the facility for site preparation, including vegetation clearing and site grading for building foundations, and for material transport and delivery. Construction-related ground disturbance would not likely result in direct impacts to archaeological resources because the location of the new

facilities would be in areas that have a low probability for archaeological resources and which have previously been subject to military activity. Although considered unlikely, potential impacts to archaeological resources through inadvertent discovery, however, could occur during construction. Mitigation is proposed in Subsection 4.3.3.6. The impact, should it occur, could be significant.

4.3.2.3.4 Military Training

Similar to the previous discussion in Subsection 4.3.2.2 for Alternative 2, no adverse effects to cultural or visual resources are anticipated as a result of the increased military training under Alternative 3. Additional helicopter use of Ladd AAF would be compatible with the current mission of FWA and its original use as a military airfield. The proposed increase in takeoffs and landings under Alternative 3 would not alter the integrity of the NHL.

4.3.2.4 Summary of Impacts to NHL and Cold War Historic District under Alternatives 2 and 3

With the implementation of either Alternative 2 or Alternative 3, a potential exists to affect the overall historic integrity of the NHL. An evaluation was conducted to determine the potential impacts to the NHL and to consider potential effects to the Cold War Historic District. The NHL and the Cold War Historic District have boundaries that overlap in several areas (see Figure 3.3.a); however, the impacts associated with the Proposed Action would result in different impacts to these two separate districts. The Proposed Action could adversely impact the NHL but would not impact the Cold War Historic District, even though their boundaries overlap.

The current functions housed in Hangars 2 and 3 would be relocated to the new hangars that are proposed for construction under Alternatives 2 and 3. Although the first phase of construction begins in 2010, the new hangars would not be constructed until 2013 at the earliest because they are part of later construction phases.

Section 110 of the NHPA requires federal agencies to use, to the maximum extent feasible, historic properties available to the agency prior to acquiring, constructing, or leasing properties for purposes of carrying out agency responsibilities. For an NHL, Section 110 states, "the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to review the undertaking."

In response to USARAK's Section 110 commitment regarding Hangars 2 and 3, the current aviation functions housed in Hangars 2 and 3 would remain in place through the first full two phases of construction associated with the Proposed Action. Only after the new hangars are built would the current functions relocate, and the use of Hangars 2 and 3 could possibly change. FWA potentially cannot define the possible new use for Hangars 2 and 3 until after the new hangars are constructed.

The Section 106 consultation process between the Army and the State Historic Preservation Officer (SHPO), National Park Service (NPS), ACHP, certified local governments, and other interested parties has been conducted concurrently with the development of this EIS. This consultation process has been instrumental in refining the Proposed Action to avoid or minimize impacts to FWA's historic resources and developing mitigation measures for potentially significant or unavoidable impacts (Subsection 4.3.3). A Programmatic

Agreement, included in Appendix F, has been prepared to formalize mitigation commitments, outline the responsibilities of consulting parties, and define the process for resolving longer-term compliance issues, such as future use of Hangars 2 and 3. Because Hangars 2 and 3 would continue their current use for a number of years after the completion of the Section 106 consultation process for the current Proposed Action, and because FWA currently does not know the future disposition of Hangars 2 and 3, all of the potential effects cannot be fully evaluated at present. When the future disposition of Hangars 2 and 3 is decided, the current consultation process would be continued as part of the implementation plans for these hangars (see mitigation measures in Subsection 4.3.3.3 for the adverse effect associated with the potential reuse of the hangars). The Army could potentially enter into a Programmatic Agreement with SHPO, ACHP, NPS, and other interested parties to outline the process for evaluating changes in use of Hangars 2 and 3. Because the effects of changes in use of Hangars 2 and 3 are presently unknown, the potential effects would be treated as a significant impact.

4.3.2.4.1 Potential Impacts to the NHL

Evaluation of the impacts to the NHL district included reviewing the NHL nomination and supporting documentation on the significance of the landmark to U.S. history. A review of the existing condition of the properties within the NHL was also conducted (see photographs that follow in this section). Careful consideration was given to the impacts of new construction within the boundaries of the NHL district.

The impacts to the NHL would adversely affect the historic integrity and viewshed associated with the NHL's WWII history. The NHL has undergone numerous changes over time. Many of the buildings within the NHL have been rehabilitated with original materials to replace doors, windows, siding, and roofs. Additions were constructed on some WWII buildings. These changes have affected the NHL's historic integrity of design, materials, workmanship, and location. In addition, demolitions have reduced the density of the NHL, thereby affecting the setting, association, and feeling of the NHL. Some of the contributing buildings are pictured below.

Building 1555

Building 1565

Building 1562

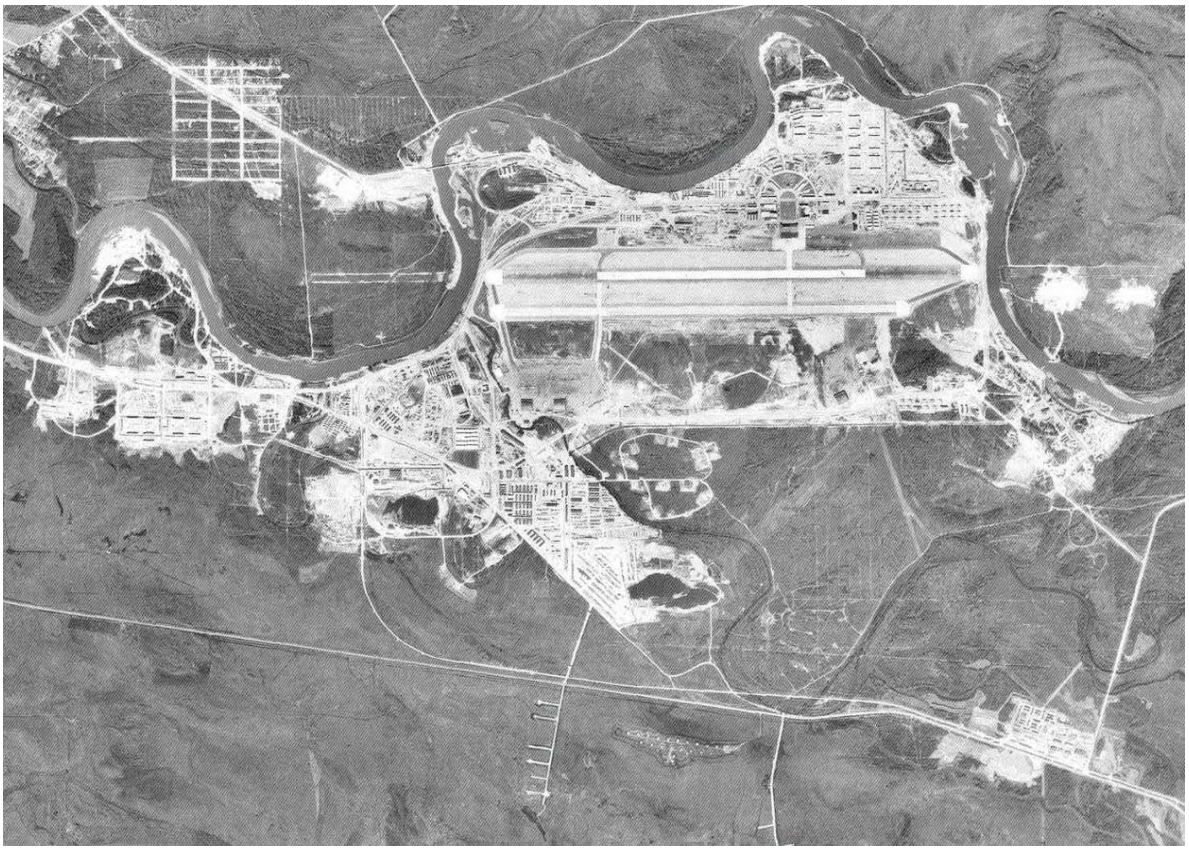
Building 1557 (Hangar 1)

To be listed as an NHL means that the historic resources are the best representatives of the themes for which they have been nominated. NHLs are a very small, elite group of historic resources when compared to those properties listed in the NRHP. While there are more than 100,000 resources listed on the NRHP, there are fewer than 2,500 NHLs. An NHL must have a high degree of integrity (NPS, 2008) and, therefore, changes and alterations to an NHL, either in the past or into the future, must be monitored carefully.

The Proposed Action would result in adverse impacts to the NHL. New construction for the Proposed Action would increase the density of the structures within the NHL. The new construction would be on the south side of the flight line, not directly affecting the historic integrity of the North Post of the NHL; however, there would be adverse visual impacts. New infill construction in the NHL is a significant impact.

The south side of the NHL has had numerous modifications as buildings were demolished under a Memorandum of Agreement with the Alaska SHPO and NPS, and new hangars and other mission-related Cold War structures were constructed. Historically, the south side of the flight line had more large-scale structures. In addition to Hangars 2 and 3, Hangar 6, a Birchwood hangar, was located on the south side of the flight line. Two Kodiak hangars, meanwhile, were located on the eastern end of the North Post. Hangar 6 has since burned down and the two Kodiak hangars have been demolished. After WWII, Hangars 4 and 5 and the combined Hangars 7 and 8 were constructed on the south side of the flight line as part of the Cold War buildup. Hangars 4 and 5 were demolished, but the combined Hangars 7 and 8 remain. A new Hangar 6 was just recently constructed.

The design of the new Hangar 6, approved through the Section 106 process with consulting parties, is larger than the original Birchwood hangars. Although the installation has had more hangars in the past, none was of the scale of the hangars in the Proposed Action alternatives. As can be seen from the 1949 FWA aerial photograph in Figure 4.3.g, the number of structures located south of the flight line has changed. Hangars 2 and 3 were the largest structures, with Hangar 6 being slightly smaller. Smaller structures are also seen in this aerial that have since been demolished. Hangars 4 and 5 and the combined Hangars 7 and 8 were not constructed until the mid-1950s.



Many of the buildings included in the 2000 NHL nomination were classified as WWII temporary "Butler buildings." Buildings constructed during WWII were classified as either permanent or temporary, or in some cases even semi-permanent. Permanent buildings were constructed of concrete and metal, and temporary buildings were constructed of wood. During WWII, with the scarcity of metal for construction, many of the buildings erected for mission support, barracks, and warehouses were constructed of wood. A nationwide Programmatic Agreement for the demolition of WWII temporary buildings was signed in 1986 and amended in 1990. The Programmatic Agreement defined the stipulations for demolition of WWII temporary buildings, including documentation of each building type and a historic context defining the construction during the war. Several of the buildings constructed during WWII, and located within the NHL district, were demolished under this agreement (U.S. Department of Defense [DoD], 1986).

Even considering the changes that have occurred to the NHL over time, the impacts associated with Proposed Action alternatives would be adverse. Under the Proposed Action, there would be new infill construction, potential change in use of Hangars 2 and 3, and intrusions to the viewshed to and from the NHL in the vicinity of Hangars 2 and 3. The impact is significant. There would be no auditory impacts to the NHL under either Alternative 2 or Alternative 3.

4.3.2.4.2 Potential Impacts to the Cold War Historic District

Investigation of the impacts to the Cold War Historic District included reviewing the Cold War context statement and the integrity of the existing properties within the historic district that could be affected by implementation of either Alternative 2 or Alternative 3.

Construction of new hangars and mission-related structures planned for the south side of the flight line would be constructed within the boundaries of the Cold War Historic District. Additionally, a portion of the construction for any of the Proposed Action alternatives would lie outside the boundaries of the Cold War Historic District in the South Post. The Cold War Historic District's boundaries are similar to those of the NHL; however, the criteria for integrity and eligibility for the Cold War Historic District are less stringent than those for the NHL. The period of significance for the Cold War is 1946 to 1991. While most Cold War construction occurred before 1961, much of it on the south side of the flight line, construction of new structures continued in the 1970s and 1980s. Within the Cold War Historic District, there is no overall plan for design, materials, and setting as there was with the NHL. Buildings and structures were constructed as needed in the areas determined to be most efficient or available.

New construction for the Proposed Action alternatives would not affect the integrity of the Cold War Historic District because more modern construction associated with the Cold War already lies within the district and the AF. Demolition and new construction would not impact the Cold War Historic District's historic integrity. The impact is less than significant.

4.3.2.5 Summary of Impacts

This section has described impacts to cultural resources and visual resources under the No Action alternative (Alternative 1) and the Proposed Action alternatives (Alternatives 2 and 3). In each case, impacts to both the NHL district and the Cold War Historic District were considered and evaluated. Although the two district boundaries substantially overlap (see Figure 3.3.a), it was concluded that there would be no effects to the historic integrity of the Cold War Historic District related to new construction and demolition, visual impacts, or auditory impacts. Following are three of the main concerns regarding potential adverse effects of the Proposed Action on the NHL district:

- Infill construction in the NHL district would not be similar in scale to nearby historic properties.
- Proposed new hangar would impede on the viewshed between Hangars 2 and 3 and the North Post.
- Potential change in the use of Hangars 2 and 3.

Table 4.3.c presents a comparative summary of effects to cultural and visual resources by alternative.

A clear distinction is made in this EIS and in Table 4.3.c between visual impacts that relate specifically to cultural resources and impacts to FWA visual resources in general. Visual impacts to cultural resources are those impacts to the viewshed of the NHL district or Cold War Historic District that might affect the integrity of association, setting, or feeling of these historic districts (see Subsection 4.3.1.1 for a discussion of integrity of historic resources). Visual impacts in general (i.e., those not explicitly linked to issues of historic integrity)

involve disturbances to the existing FWA viewshed, such as blocking views from or to certain viewpoints, or diminishing their aesthetic qualities. Table 4.3.c shows visual impacts both in relation to cultural resources and in general, so that there can be adverse visual effects to cultural or historic resources but no adverse visual effects to FWA's visual resources in general. Similarly, auditory impacts listed in Table 4.3.c are those that relate specifically to noise effects on the historic districts. Noise impacts in general (i.e., those not explicitly linked to cultural and historic resources) are separately discussed in Sections 3.4 and 4.4.

TABLE 4.3.c
Comparative Summary of Impacts by Alternative for Cultural Resources and Visual Resources
USARAK Aviation EIS

	Alternative 1 No Action	**Alternative 2 Aviation Task Force**	**Alternative 3 Combat Aviation Brigade**
Cultural Resources			
Number of buildings demolished Square feet of new infill construction	No aviation-related demolition or new construction	Demolition of three buildings (not historic) for a total of 47,675 square feet. 2.4 million square feet of new construction at FWA Cantonment	Demolition of three buildings (not historic) for a total of 47,675 square feet. 3.2 million square feet of new construction at FWA Cantonment
NHL	No impacts	**Adverse effects**[a] associated with demolition and new infill construction; **adverse effects** to viewshed due to new construction**; adverse effects** due to change in use for Hangars 2 and 3.	Same as Alternative 2
Cold War Historic District	No impacts	No impacts	Same as Alternative 2
Visual Resources			
Viewpoint 1 (near Hangar 1 on north side of North Taxiway)	No impacts	New hangars and other buildings seen from this location approximately 4,000 feet away to the south. No effect based on visual impact criteria[a].	Same as Alternative 2
Viewpoint 2 (from west end of Taxiway)	Significant impact	Proposed Chinook Hangar would be most visible from this location and would block views to north. Would affect character of area (Criterion 3) and views from near Viewpoint 2 (particularly near Hangars 2 and 3) to the north. Significant impact based on visual impact criteria[a].	Same as Alternative 2
Viewpoint 3 (from Neely Road)	No impacts	Proposed Chinook Hangar would be seen from this location, as would new fencing. Neither would block views nor change character of area. No adverse effect based on visual impact criteria[a].	Same as Alternative 2

TABLE 4.3.c
Comparative Summary of Impacts by Alternative for Cultural Resources and Visual Resources
USARAK Aviation EIS

	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Auditory Impacts			
NHL	No impact	Additional takeoffs and landings at Ladd AAF would be compatible with current and historic missions of military airfield. No adverse effect.	Same as Alternative 2
Cold War Historic District	No impact	Additional takeoffs and landings at Ladd AAF would be compatible with current and historic missions of military airfield. No adverse effect.	Same as Alternative 2

[a] **Cultural Resources Impact Criterion:** Physical destruction or damage to all or part of the historic resources within the NHL district and/or introduction of new elements into the NHL district that diminish the integrity of the NHL's significant historic features. See also NRHP criteria for integrity in Subsection 4.3.1.1. **Visual Impact Criteria:** *Criterion 1:* Permanently alter a site so that a sensitive viewing point or vista is obstructed or adversely affected or if the scale or degree of change appears as a substantial, obvious, or disharmonious modification of the overall view. *Criterion 2:* Prevent or substantially impair the view from a sensitive viewpoint for the duration of project construction. *Criterion 3:* Introduce physical features that are substantially out of character with adjacent developed areas. **Auditory Impacts Criterion:** Introduction of auditory elements into the NHL district that diminish the integrity of the NHL's significant historic features.

4.3.3 Mitigation for Adverse Effects to Historic Resources

Section 110 of the NHPA requires federal agencies to use, to the maximum extent feasible, historic properties available to the agency prior to acquiring, constructing, or leasing properties for purposes of carrying out agency responsibilities. For an NHL, Section 110 states, "the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council on Historic Preservation a reasonable opportunity to review the undertaking."

In response to USARAK's Section 110 commitment regarding Hangars 2 and 3, the current aviation functions housed in Hangars 2 and 3 will remain in place through the first full two phases of construction associated with the Proposed Action. Only after the new hangars are built would the current functions relocate, and the use of Hangars 2 and 3 could possibly change. FWA potentially cannot define the possible new use for Hangars 2 and 3 until after the new hangars are constructed.

The Section 106 consultation process between the Army and the SHPO, NPS, ACHP, certified local governments, and other interested parties has been conducted concurrently with the development of this EIS. This consultation process has been instrumental in refining the Proposed Action to avoid or minimize impacts to FWA's historic resources and developing the following mitigation measures for potentially significant or unavoidable impacts. A Programmatic Agreement, included in Appendix F, has been prepared to formalize mitigation commitments, outline the responsibilities of consulting parties, and define the process for resolving longer-term compliance issues, such as future use of Hangars 2 and 3.

4.3.3.1 Adverse Effect from Infill Construction within the NHL

The following mitigation measures, which are included in the Programmatic Agreement in Appendix F, are for potentially significant impacts to NHL resulting from infill construction under Alternatives 2 and 3.

- Utilize a sympathetic design for the new hangars that considers the historic character of the NHL and follows the Secretary of the Interior's standards as closely as possible.
- Involve the consulting parties in the U.S. Army Corps of Engineers' Request for Proposal (RFP) process to secure services for designing and constructing the new facilities under the Proposed Action. The consulting parties also will be involved in the contracting source selection process as described in the Programmatic Agreement (Appendix F).
- Continue to follow the FWA IDG for siting new facilities along with other guidance and processes for military master planning.

4.3.3.2 Adverse Effect on the Viewshed between Hangars 2 and 3 and the North Post within the NHL

The following measure, included in the Programmatic Agreement in Appendix F, would mitigate a significant impact that would occur under Alternatives 2 and 3.

- Involve the consulting parties in the RFP and source selection process, as outlined in the Programmatic Agreement.

4.3.3.3 Adverse Effect Resulting from Potential Change in Use of Hangars 2 and 3 within the NHL

The following measures are included in the Programmatic Agreement (Appendix F) and proposed to mitigate potential significant impacts under Alternatives 2 and 3 relating to the change in use of Hangars 2 and 3.

- Conduct a reuse study for Hangars 2 and 3. Much of the base work on cost and needed improvements was completed under a *Condition Assessment and Rehabilitation Plan* (CARP) for the hangars, so the proposed reuse study will focus on creative reuses for Hangars 2 and 3. The study will outline limitations and requirements of Hangars 2 and 3, but the majority of the focus will be on potential cost-effective uses that fit within the needs of FWA, particularly the needs of FWA's airfield.
- Update Historic American Buildings Survey documentation to record the current conditions for Hangars 2 and 3.

4.3.3.4 Additional Educational and Public Information Enhancements

- Construct a viewing platform with interpretive panels from which visitors may view the NHL and parts of the Cold War Historic District, as described in the Programmatic Agreement.

4.3.3.5 Other Mitigation

The following mitigations measures will help to enhance the historic values of the Cold War Historic District and the NHL for the benefit of public education and mitigate both

significant and less-than-significant impacts to the FWA historic districts by helping to strengthen and maintain their historic integrity of setting, feeling, workmanship, design, and materials. The Programmatic Agreement contains details about the Army's responsibilities for these mitigation efforts.

- Help the SHPO update and finalize the SHPO's report, *The Coldest Front: Cold War Military Properties in Alaska*. The report will serve as a historic context for resources associated with the Cold War in Alaska.
- Develop new design guidelines to help preserve the integrity and the heart of the NHL and the Cold War Historic District.
- Prepare a historic context for cold weather research in Alaska to support evaluation of this important but relatively unstudied area of Alaska's history.
- Develop a Teaching with Historic Places lesson plan in partnership with the Fairbanks North Star Borough School District to impart knowledge of and instill value for the Ladd Field NHL in the Fairbanks community.

4.3.3.6 Mitigation Measures for Inadvertent Discoveries of Cultural Resources during Construction

The evaluations of potential impacts to the NHL, the Cold War Historic District, and FWA in general indicated that it is unlikely that construction under Alternatives 2 and 3 would result in a significant impact to previously undiscovered cultural resources. Traditional cultural properties (TCPs) in particular are not likely to be found in the construction zones, because these areas have already been subjected to military activity. However, any construction has the potential for inadvertent discoveries of such resources, however unlikely. If such resources were encountered, the impact would be potentially significant.

- Any potential effects to previously undocumented cultural resources discovered during construction would be mitigated pursuant to FWA's *Integrated Cultural Resources Management Plan*, Standard Operating Procedure (SOP) 12. If during the course of the Undertaking any unforeseen or unanticipated effects are discovered, USAG FWA shall initiate consultation pursuant to 36 C.F.R. § 800.13 to resolve the unforeseen effect. If human remains are inadvertently discovered, USAG FWA shall cease all work and ensure that the remains are secured from further disturbance or vandalism until a plan for treatment has been developed. If USAG FWA determines that the remains are Native American, the Garrison Commander shall immediately undertake any actions necessary under the Native American Graves Protection and Repatriation Act, as amended. If USAG FWA determines that the remains are not Native American, and do not warrant criminal investigation, USAG FWA shall immediately notify the SHPO and consult with the SHPO to identify descendants or other interested parties, if any. USAG FWA, in consultation with the SHPO and any interested parties, shall develop a plan for the respectful treatment and disposition of the remains.

4.3.3.7 New Construction Visual Impact Mitigation

This measure provides a public benefit that would enhance the historic and educational values of the Ladd AAF historic resources in the NHL and the Cold War Historic District.

- The viewing platform described above in Subsection 4.3.3.4 would provide a place from which visitors may view the historic elements of the airfield. Mitigation measures described above also address potential visual effects of the Proposed Action, both for the FWA in general and in relation to the historic resources.

4.4 Noise

This section presents the environmental analysis for noise impacts resulting from implementation of the Proposed Action and alternatives. Subsection 4.4.1 presents the significance criteria, while Subsection 4.4.2 analyzes the alternatives and provides a comparative summary in table format. Subsection 4.4.3, meanwhile, discusses possible mitigation measures.

4.4.1 Significance Criteria

Noise associated with aircraft activity and small-caliber weapons (see Table 4.4.a) are the basis of the significance criteria used to assess the potential impacts of the Proposed Action alternatives. If noise levels exceed the limits set in Table 4.4.a, a significant adverse impact would result. Significance criteria for traffic and vehicle noise are not provided because no new vehicle types would be introduced as part of Alternatives 2 or 3. Subsection 4.4.2.4 provides an analysis of the alternatives compared to the significance criteria.

TABLE 4.4.a
Noise Significance Criteria
USARAK Aviation EIS

Noise Topic	Criterion
Aircraft activity – Training route overflights[a]	Noise Zone III – >75 A-weighted night-night level (ADNL) contour extends beyond the boundary of the installation into a noise-sensitive area
Aircraft activity – Airfields	Maximum flight noise level of 90 decibel (A-weighted) (dBA) extends beyond the boundary of the installation into a noise-sensitive area
Small-caliber weapons[a]	Noise Zone III – >104 PK15(met) contour extends beyond the boundary of the installation into a noise-sensitive area

Notes:
[a] Correlates to more than 39 percent of the population being annoyed, as noted in Table 3.4.c.

4.4.2 Environmental Consequences for Noise

4.4.2.1 Alternative 1: No Action

The No Action alternative represents the continuation of current activity levels and associated noise levels. Subsection 3.4.3 describes the baseline conditions for noise.

4.4.2.1.1 Aviation Personnel

Implementing the No Action alternative would not result in a change in the number of Soldiers, their dependents, or associated civilian support staff in Alaska. The current noise level generated by aviation personnel would not change and, therefore, no impact to noise would result.

4.4.2.1.2 Aviation Assets

Implementing the No Action alternative would not result in a change in the number or activities of aviation assets (helicopters, vehicles, or generators) in Alaska. The current noise level generated by aviation assets would not change and, therefore, no impact to noise would result.

4.4.2.1.3 Facilities Construction and Demolition

Noise generated from non-aviation-related activities, such as operations and routine maintenance of buildings and roads, would continue under the No Action alternative. These activities would take place within the installation boundaries, mostly in the cantonment areas, and would not extend outside the installation boundaries. Noise impacts associated with operations and maintenance (O&M), including construction, would be temporary and short-term in duration and would, therefore, be considered less than significant.

4.4.2.1.4 Military Training

Table 4.2.b lists the number of average and peak operations at Bryant AAF, Ladd AAF, and Allen AAF. Currently, no Army helicopter operations take place at Eielson AFB. Implementing the No Action alternative would not result in a change in aviation training activities in Alaska. The current noise level generated by military training would not change and, therefore, no impact to noise would result.

4.4.2.2 Alternative 2: Aviation Task Force

4.4.2.2.1 Aviation Personnel

The increase in aviation personnel and associated vehicle traffic would not generate new noise zone (NZ) contours. The increase in traffic would increase the frequency of vehicle related noise, but to a minor level. Overall, environmental noise effects would be less than significant from adding new military personnel, dependents, and civilian support personnel.

4.4.2.2.2 Aviation Assets

Noise impacts associated with the use of additional helicopters (e.g., to conduct military training) under Alternative 2 are addressed in Subsection 4.4.2.2.4.

Alternative 2 would also increase the number of military support vehicles and generators. While these additional vehicles and generators would create additional noise, they would not result in noise contours extending beyond the installation boundary into a noise-sensitive area.

4.4.2.2.3 Facilities Construction and Demolition

Alternative 2 would involve facility construction and demolition, primarily along the active Ladd AAF at FWA. These activities could potentially result in temporary elevated noise levels at noise-sensitive locations adjacent to the construction and demolition sites (see Subsection 3.4.3.1). Elevated noise levels during construction should not extend outside the boundaries of FWA because construction would only occur within the cantonment area. Noise resulting from construction and demolition activities would be temporary and short term in duration because the construction season in Alaska usually begins in late April or

early May and ends in late September or early October. All facility construction and demolition would be complete by 2014.

New O&M activities would be performed within and adjacent to new facilities under Alternative 2. While these additional O&M activities would create additional noise, it is not expected that these increases would create noise contours that extend beyond the installation boundary into a noise-sensitive area. Noise associated with increased airfield operations is addressed in Subsection 4.4.2.2.4.

4.4.2.2.4 Military Training

Table 4.2.c shows the helicopter operations (i.e., takeoffs and landings) for each airfield proposed under Alternative 2. No change in Army helicopter operations would occur under Alternative 2 at Bryant AAF, Allen AAF, and Eielson AFB and, therefore, no noise impact would occur at these locations.

The average number of operations at Ladd AAF would increase from approximately 15 per day to approximately 42 operations daily. Peak operations per day at Ladd AAF could increase from approximately 35 to about 222. Impacts at Ladd AAF, the corridors, and training facilities are discussed below.

Airfields

The frequency of operations would increase. Ladd AAF is in NZ III, which does not extend across the FWA installation boundary and does not contain incompatible land uses (see Figure 3.4.a). Because the additional operations take place at Ladd AAF and NZ III would not change, the noise impact at Ladd AAF associated with increased operations would be less than significant.

Given the fact that if two noise events with different noise levels occur at the same time, their effects are not additive. Thus, the addition of Kiowa helicopters to the airspace would not increase the maximum A-weighted decibel (dBA) noise levels. In addition, Kiowa helicopters are quieter than the Blackhawk or Chinook (CHPPM, 2007a; CHPPM, 2007b) (Table 3.4.a). Therefore, no increase to noise annoyance is expected due to the increased Kiowa helicopter traffic under Alternative 2. The noise impact resulting from addition of Kiowa helicopters would be less than significant.

Flight Corridors

Additional helicopter flights operating from Ladd AAF would take place primarily over military land but also along any helicopter corridors and over urban areas (for aerial reconnaissance training). Some population areas are located within or near the corridors. These include outlying areas of Fairbanks (located between Ladd AAF and the TFTA) and the city of North Pole (located between YTA and the TFTA) (see Figures 3.4.a and 3.4.b). Under Alternative 2, the number of helicopters using USARAK flight corridors does not generate A-weighed day-night average sound level (ADNL) noise zones (i.e., meaningful estimates of average or cumulative noise) (CHPPM, 2007a; CHPPM, 2007b). Thus, no NZs (including NZ III) would extend into noise-sensitive areas and, therefore, potential impacts from noise along the fight corridors would be less than significant.

Portions of the development at Approach Hill (east of Ladd AAF) are contained in NZ II. As discussed in Section 3.4, a good predictor of annoyance at airfields with less than 200

operations per day (as would be the case on most days under Alternative 2) is the maximum level of the three nosiest events (Rylander, 1974; Rylander, 1988). Consequently, the maximum level of individual aircraft noise, rather than the cumulative or average level, determines annoyance. Table 3.4.a provides the maximum dBA noise levels for the helicopters associated with Alternative 2. The loudest aircraft in the USARAK inventory, the Chinook CH-47, generates 84 dBA at a distance of 500 feet AGL, the minimum flight elevation over non-military lands. Based on these numbers and typical annoyance in response to noise levels (see Table 3.4.b), it is expected that approximately 30 percent of the affected population would be annoyed. Because the maximum level of the individual aircraft noise (i.e., the noisiest events) would not change, the noise impact would be less than significant.

The frequency of helicopter overflights over any area within any of the flight corridors, or near them, is expected to increase over current conditions, resulting in an adverse effect on nearby residences. Use of certain corridors depends on mission and training requirements, and cannot be predicted. As discussed in Subsection 3.4.3.4, helicopters mostly follow the centerline and, therefore, the greatest noise effect is within the corridor. Annoyance buffers were calculated based on the loudest aircraft in the USARAK inventory, the Chinook CH-47, which generates 84 dBA at a distance of 500 feet AGL. Based on these numbers and typical annoyance in response to noise levels (see Table 3.4.b), it is expected that approximately 30 percent of the affected population would be annoyed. Because the annoyance buffers are based upon maximum noise levels of the aircraft, rather than a cumulative or average level, the annoyance buffer size would not change based upon the number of aircraft in the corridor at any given time (CHPPM, 2007a; CHPPM, 2007b). Because the maximum level of the individual aircraft noise (i.e., the noisiest events) would not change, the noise impact would be less than significant.

For reconnaissance training over urban areas (as described in Section 3.2), helicopters would continue to fly at elevations of 500 to 1,000 feet AGL. As currently conducted, notifications would be mailed to the public prior to all urban training activities.

Training Facilities

Alternative 2 would result in an increase use of training ranges and facilities for live-fire training; however, there would be no new types of weapons training on the installations. During evaluations of weapons noise, contours are based on peak levels of weapons training rather than a cumulative or average level. The size of contours would not change if the number of rounds fired increases or decreases (CHPPM, 2007a; CHPPM, 2007b). Therefore, the noise impact of aviation-related weapons training at FWA remains essentially unchanged from the No Action alternative baseline.

Additionally, all maneuver and non-live-fire training activities would continue to occur within designated training areas inside the installations' boundaries and away from noise-sensitive populations.

4.4.2.3 Alternative 3: Combat Aviation Brigade

Table 4.2.d shows the helicopter operations (i.e., takeoffs and landings) for each airfield proposed under Alternative 3. Helicopter operations at Ladd AAF would increase as described under Alternative 2. At Bryant AAF and Allen AAF, operations would double (to approximately 128 operations on peak days) and triple (to approximately five operations on

peak days), respectively, compared to current operations. Army helicopter operations at Eielson AFB would be initiated with an average of approximately four operations per day.

4.4.2.3.1 Aviation Personnel

The increase in aviation personnel and associated vehicle traffic would not result in new NZ contours. Additional personnel would increase local traffic and increase the frequency of vehicle-related noise, but only to marginal levels. Therefore, no significant adverse environmental effects are expected as a result of noise from adding new military aviation personnel, dependents, and civilian support personnel.

4.4.2.3.2 Aviation Assets

Noise impacts associated with the use of additional helicopters (e.g., to conduct military training) under Alternative 3 are addressed in Subsection 4.4.2.3.4.

Alternative 3 would increase the number of military support vehicles and generators. While these additional vehicles and generators would create additional noise, they would not result in noise contours extending beyond the installation boundary into a noise-sensitive area.

4.4.2.3.3 Facilities Construction and Demolition

Similar to Alternative 2, additional facility construction and demolition at FWA would occur under Alternative 3. No construction or demolition activities at FRA or Eielson AFB are proposed under this alternative. The construction and demolition activities at FWA could potentially result in temporary elevated noise levels at noise-sensitive locations adjacent to the construction and demolition sites (see Subsection 3.4.3.1). Elevated noise levels during construction would not extend outside the boundaries of FWA because construction would only occur within the cantonment area. Noise resulting from construction and demolition activities would be temporary and short term in duration as construction season in Alaska usually begins in late April or early May and ends in late September or early October. The timeframe for completion of all facilities construction and demolition is uncertain at this time, but is expected to continue beyond 2014.

New O&M activities would be performed within and adjacent to new facilities under Alternative 3. While these additional O&M activities would create added noise, it is not expected that these increases would create noise contours that extend beyond the installation boundary into a noise-sensitive area. Noise associated with increased airfield operations is address in Subsection 4.4.2.3.4.

4.4.2.3.4 Military Training

Noise impacts associated with increased helicopter operations at Ladd AAF, under Alternative 3, including urban reconnaissance training, would be as described under Alternative 2 (see Subsection 4.4.2.2.4).

Airfields

Flight operations at Bryant AAF, Allen AAF, and Eielson AFB would increase. Existing noise contours would not change from current operations. At Bryant AAF, contours would remain within the installation boundaries, while at Allen AAF, NZ II and NZ III contours would remain in the runway area. At Eielson AFB, existing aircraft noise would continue to

determine the noise effects, with the closest residential area, Moose Creek, receiving up to 70 decibels (dB) (similar to NZ II). The effects, of additional operations on the noise in the vicinity of the airfields would be less than significant.

Kiowa and Apache helicopters are quieter than the Blackhawk or Chinook (CHPPM, 2007a; CHPPM, 2007b), and in point of fact, the effects of two simultaneous noise events with different noise levels are not additive. Thus, the addition of Kiowa and Apache helicopters to the airspace would not increase the maximum noise dBA levels. Therefore, no increase to noise annoyance is expected due to the increased helicopter operations under Alternative 3 and the impact from addition Kiowa and Apache helicopters is less than significant.

Flight Corridors

Additional helicopter flights operating from Bryant AAF, Allen AAF, and Eielson AFB would take place primarily over military land but also along any helicopter corridors. Some population areas are located within or near the corridors (see Figures 3.4.c through 3.4.f). Under Alternative 3, the number of helicopters using USARAK flight corridors does not generate ADNL noise zones (i.e., meaningful estimates of average or cumulative noise) (CHPPM, 2007a; CHPPM, 2007b). Thus, no NZs (including NZ III) would extend into noise-sensitive areas and, therefore, potential impacts from noise along the fight corridors would be less than significant.

The frequency of helicopter overflights over any area within any of the flight corridors, or near them, is expected to increase over current conditions, resulting in an adverse effect on nearby residences. Use of certain corridors depends on mission and training requirements, and cannot be predicted. As discussed in Subsection 3.4.3.4.2, helicopters mostly follow the centerline and, therefore, the greatest noise effect is within the corridor. Annoyance buffers were calculated based on the loudest aircraft to be used under Alternative 3, the Chinook CH-47, which generates 84 dBA at a distance of 500 feet AGL and a speed of 70 knots. (The Apache AH-64 helicopter generates 83 dBA at a distance of 500 feet AGL and a speed of 70 knots.) Based on these numbers and typical annoyance in response to noise levels (see Table 3.4.b), it is expected that approximately 30 percent of the affected population would be annoyed. Because the annoyance buffers are based upon maximum noise levels of the aircraft, rather than a cumulative or average level, the annoyance buffer size would not change based upon the number of aircraft in the corridor at any given time (CHPPM, 2007a; CHPPM, 2007b). Because the maximum level of the individual aircraft noise (i.e., the noisiest events) would not change, the noise impact would be less than significant.

Training Facilities

Alternative 3 would result in an increase use of training ranges and facilities for live-fire training; however, there would be no new types of weapons training on the installations. During evaluations of weapons noise, contours are based on peak levels of weapons training rather than a cumulative or average level. The size of contours would not change if the numbers of rounds fired increases or decreases (CHPPM, 2007a; CHPPM, 2007b). Therefore, the noise impact of aviation related weapons training at FWA remain essentially unchanged from the No Action alternative baseline.

Additionally, all maneuver and non-live-fire training activities would continue to occur within designated training areas inside the installations' boundaries and away from noise-sensitive populations.

4.4.2.4 Summary of Impacts

Table 4.4.b presents a comparative summary of how the alternatives would affect noise. None of the alternatives would result in significant impacts as defined in Table 4.4.a.

TABLE 4.4.b
Comparative Summary of Impacts by Alternative for Noise
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Aircraft Activity	NZ II contour at Ladd AAF extends beyond installation boundary into residential development.	Noise zones would be the same as under the No Action alternative. The noise levels would not change. The frequency of noise annoyance experienced with helicopter flights and takeoffs and landings would increase, including within areas over non-military lands. The impact would be less than significant.	Noise zones would be the same as under the No Action alternative. The noise levels would not change. The frequency of noise annoyance experienced with helicopter flights and takeoffs and landings would increase, including within areas over non-military lands. The impact would be less than significant.
Small-Caliber Weapons	NZ II contour extends beyond the installation boundary; however, no incompatible land uses contained within contours.	Noise zones would be the same as under the No Action alternative.	Noise zones would be the same as under the No Action alternative.

4.4.3 Mitigation

As a means of mitigating potential impacts, the Army would continue to implement existing measures and guidelines for avoiding and minimizing noise impacts, such as:

- Locate facilities for noise-sensitive receptors (e.g., residential housing, hospitals) in areas compatible with such uses.
- Collect comments or complaints regarding noise, including a 24-hour feedback line.
- Continue public notification of nighttime firing.
- Limited hours of firing demolitions, field artillery, and mortars are 6 a.m. to 10 p.m. The public is notified of exceptions to firing hours by the Public Affairs Office through publication of a Notice of Firing.
- Continue to implement existing USARAK Regulations 95-1 and 350-2, which regulate military helicopter travel outside USARAK lands, including operations over populated areas, livestock, dwellings, and other noise-sensitive areas.

4.5 Hazardous Materials/Hazardous Waste

USARAK is firmly committed to a policy of environmental stewardship for all lands under USARAK control. Environmental policies on USARAK-controlled lands are based upon

four pillars of stewardship: prevention of pollution and the minimization of damage to the environment; conservation of natural resources; compliance with all applicable environmental laws and regulations; and restoration of lands damaged by past military activities (USARAK Pamphlet 200-1). To fulfill these commitments to the environment and to Soldiers living, working, and training on USARAK lands, the following analysis of aviation-related impacts was conducted.

4.5.1 Significance Criteria

The significance criteria for hazardous materials and hazardous waste in Table 4.5.a are based on the relevant statutes and regulations governing the handling and disposal of hazardous materials and hazardous wastes (see Section 4.5). The regulations and the resulting criteria address hazardous waste management; hazardous materials and hazardous waste contamination; toxic substances management; asbestos abatement and management; and hazardous materials spill management. Subsection 4.5.2 provides an analysis of impacts of the Proposed Action alternatives compared to the significance criteria.

TABLE 4.5.a
Hazardous Materials/Hazardous Waste Significance Criteria
USARAK Aviation EIS

Topic	Criterion for Significant Impact
Explosion, Spill, or Release	Increase the risk for explosion, spill, or release of hazardous waste or materials such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.
Spill or Release	Increase the risk of a spill or release of a hazardous substance (as defined by Title 40, Code of Federal Regulations (CFR) Part 302 [Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)], or Parts 110, 112, 116, and 117 [CWA]) such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.
Water	Increase the risk for an accidental spill of hazardous or toxic materials in or near a body of water, such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.
Contaminated Sites	Affect contaminated sites or the progress of remediation activities to a significant degree to require significant regulatory re-negotiation of selected site remedies or significant delays to existing remediation plans.
Generation	Increase the generation of hazardous substances to a significant level such that existing management plans and procedures, waste handling contracts, and disposition alternatives must be reevaluated.
Endanger the Public	Significantly increase the risk to endanger the public or environment during the storage, transport, or use of hazardous materials such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.

4.5.2 Environmental Consequences for Hazardous Materials/Hazardous Waste

4.5.2.1 Alternative 1: No Action

4.5.2.1.1 Aviation Personnel

Under Alternative 1, there would be no increase in aviation personnel currently stationed at FWA, FRA, or Eielson AFB. The amount of hazardous materials and generation of hazardous waste, such as household cleaners and petroleum fuel, would not increase. The potential for accidental spills and public endangerment or environmental impacts would not change and would continue to be managed under the applicable federal, State, and Army regulations identified in Subsection 3.5.1. There would not be significantly increased risks related to hazardous substances or significant increases in generation of hazardous substances upon implementation of Alternative 1. Therefore, Alternative 1 would result in no impacts related to hazardous materials or hazardous waste.

4.5.2.1.2 Aviation Assets

Implementation of Alternative 1 would not increase the number of aviation assets at FWA, FRA, or Eielson AFB. Therefore, the amount of hazardous materials stored and used on the installation, such as fuel, paints, solvents would not increase. The volume of hazardous waste generated by Army activities would remain the same as under current conditions. hazardous materials and hazardous waste would continue to be managed and disposed of in accordance with relevant federal, State, and Army regulations and guidance governing such materials. Therefore, Alternative 1 would result in no impacts related to hazardous materials or hazardous waste.

4.5.2.1.3 Facilities Construction and Demolition

Under the No Action alternative, there would be no need for new construction or demolition of existing facilities to support an Aviation Task Force or CAB. Hazardous materials and hazardous waste attributable to construction under the Proposed Action Alternatives would not occur, and O&M programs and procedures would remain intact for ongoing programs and processes. Therefore, Alternative 1 would result in no impacts related to hazardous materials or hazardous waste.

4.5.2.1.4 Military Training

Under Alternative 1, no additional training exercises would occur and, therefore, no changes would result from ongoing. There would be no changes to the existing hazardous materials or hazardous waste conditions. The potential for accidental spills and public endangerment or environmental impacts would not change and would continue to be managed under the applicable federal, State, and Army regulations identified in Subsections 3.5.1 and 3.5.3. There would not be significantly increased risks related to hazardous substances or significant increases in generation of hazardous substances. Therefore, Alternative 1 would result in no impacts related to hazardous materials or hazardous waste.

4.5.2.2 Alternative 2: Aviation Task Force

4.5.2.2.1 Aviation Personnel

Alternative 2 would increase the number of aviation personnel stationed at FWA to approximately 1,200 (Table 2.5.a). The increased aviation personnel would result in a proportional increase in the amount of hazardous materials and hazardous waste, such as household cleaners and petroleum fuel. Because USARAK recycles a majority of hazardous wastes, the capacity for disposal of the additional volume generated as a result of the increase in personnel is high. The recycling program would continue under Alternative 2 and would reduce this potentially adverse impact to less than significant. Increased hazardous material use has the potential to increase the risk of exposure or contamination, including explosions, spills, or releases to soil and water bodies. This potentially adverse impact would be mitigated to less than significant through continued implementation of applicable procedures and regulations. Army hazardous material handling and disposal SOPs would need to be expanded to accommodate the anticipated increase in quantity. Existing federal and Army regulations and enforcement would continue to address the increased on-installation use and to limit exposure. USARAK would continue to manage hazardous materials using existing environmental systems and programs (USARAK Pamphlet 200-1) to manage the handling and disposal of hazardous materials and hazardous waste encountered on a more frequent basis. Programs, such as battery collection and household cleaner chemical disposal, are in place to mitigate the environmental consequences of hazardous materials and hazardous waste in daily human activity. With the increased number of Soldiers, dependents, and civilians, USARAK would expand and accommodate its mitigation programs to handle the increased volume of hazardous materials and hazardous waste anticipated to occur.

Aviation personnel increases that would occur under Alternative 2 would result in no impacts related to increased risk of explosion or known contaminated sites. As discussed in Subsection 4.5.2.2.3, stationing of increased personnel would not necessitate construction of housing in areas of known contamination or unexploded ordnance (UXO).

4.5.2.2.2 Aviation Assets

Alternative 2 would increase the number of aviation assets to a total of 72 helicopters, and would add 77 generators and 285 vehicles to the existing USARAK assets. The increased aviation assets would result in a proportional increase in the amount of hazardous materials stored and used on the installation, such as fuel, paints, and solvents, and in the amount of hazardous waste generated by Army activities. USARAK personnel expect the increased consumption of hazardous materials to range from approximately 84,000 to 326,000 pounds annually, with an increase in hazardous waste ranging from 4,400 to 16,300 pounds, depending upon the particular training rotation and maintenance activities that would be performed by the aviation unit. For example, when aviation units return from combat, a higher quantity of hazardous materials and hazardous wastes are generated to reset the equipment (the upper limit of the range). Increased hazardous material use has the potential to increase the risk of exposure or contamination, including spills or releases to soil and water bodies These increases would potentially result in less-than-significant adverse impacts. Because USARAK recycles a majority of hazardous wastes, the capacity for disposal of the additional volume generated as a result of the increase in aviation assets is

high. As discussed in Subsection 3.5.3, existing Alaska DoD contracts are in place for disposition, sale, or disposal of the additional hazardous materials and wastes, and no capacity constraints are anticipated. Local operating procedures would need to be updated to accommodate the increased volume. USARAK would continue to use existing procedures and programs (USARAK Pamphlet 200-1) to manage the handling and disposal of hazardous materials and hazardous waste encountered on a more frequent basis. Therefore, compliance with applicable plans and regulations and updating local operating procedures would result in less-than-significant impacts.

Potential impacts related to increased risk of explosion or known contaminated sites as a result of increased aviation assets are discussed in Subsection 4.5.2.2.3.

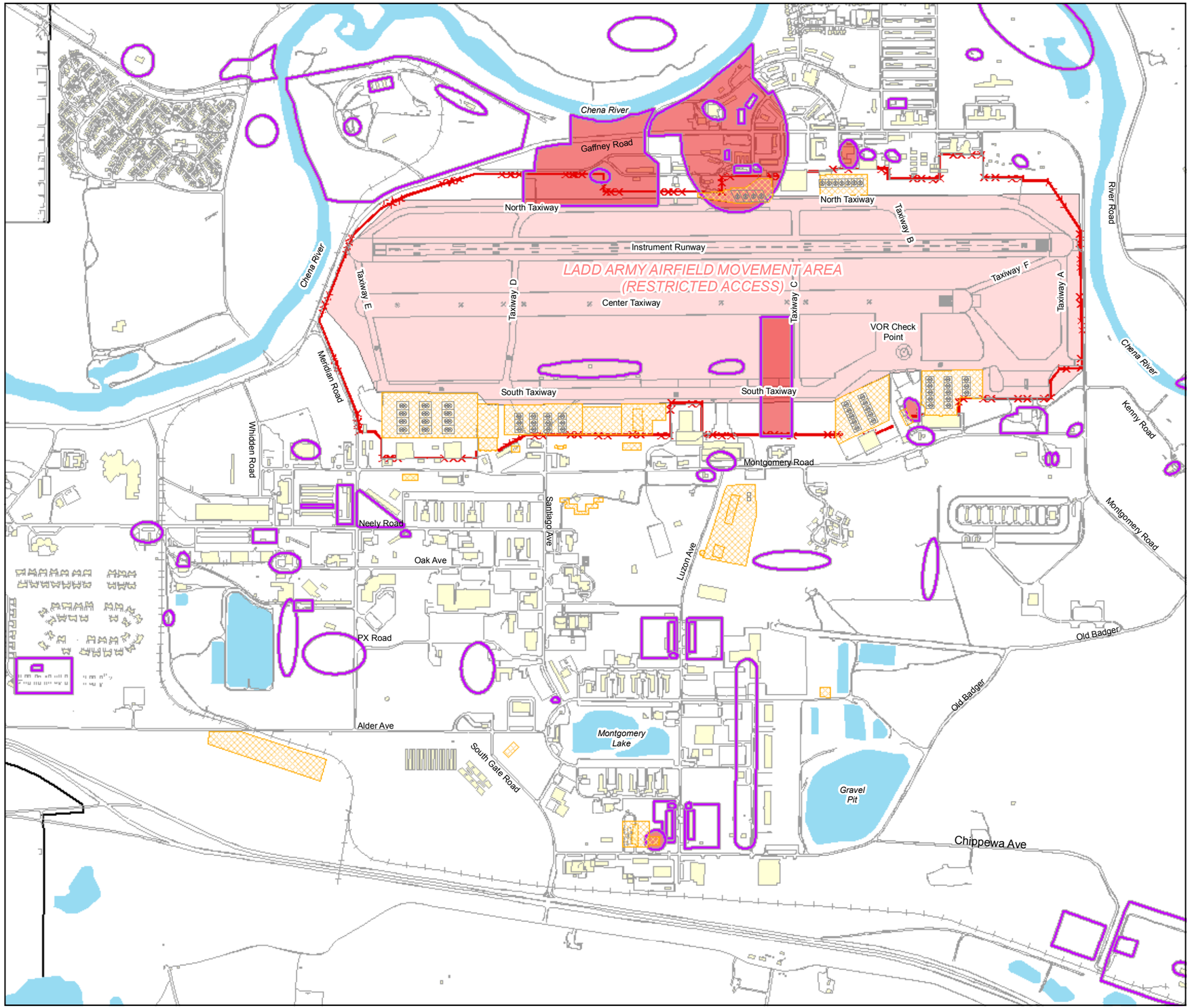
4.5.2.2.3 Facilities Construction and Demolition

The increased number of aviation assets and supporting personnel would result in a number of new facilities to be constructed or renovated in support of the newly formed Task Force. Construction and demolition activities would produce considerable amounts of both hazardous and non-hazardous waste materials. FWA waste management will be able to accommodate construction and demolition waste materials (Gray, 2009). Construction-related hazardous materials, such as lead paint, would be disposed at State-permitted facilities in Washington or Oregon. Non-hazardous waste materials and asbestos from construction activities would be disposed at the State-permitted FWA solid waste landfill or the Fairbanks North Star Borough (FNSB) landfill. The FNSB landfill has adequate capacity for the next 40 years (Bredlie, 2009, personal communication). Recycling and reduction policies and procedures currently used by USARAK would reduce the amount of construction- and demolition-related waste materials and, therefore, would reduce potentially adverse impacts to less than significant. Potential impacts related to construction site soil contamination and O&M of facilities under Alternative 2 are discussed below.

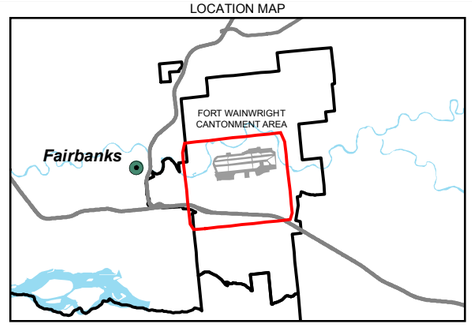
Construction Site Soil Contamination

At FWA, construction activities would result in soil disturbance and possible exposure of existing subsurface contamination resulting from historical spills and other activities. Figure 4.5.a shows contamination areas on or near the construction and demolition areas at FWA under Alternative 2. At proposed construction sites near the airfield, contamination is almost exclusively petroleum-related. The existing contaminated sites either have achieved a "response complete" or are currently being remediated. If earthwork or excavation during construction of new facilities resulted in the discovery of undocumented subsurface contamination, adverse impacts would include an increased potential for exposure and public endangerment. Contaminated soil would be removed and properly disposed of in accordance with appropriate State and/or federal regulations. Additionally, hazardous materials (such as asbestos) found during the demolition process would undergo remediation and removal as described in the FWA *Asbestos Management Plan* (AMP). Continued adherence to applicable regulations and management plans would result in less-than-significant adverse impacts related to contaminated sites and exposure or endangerment of the public.

As described in Subsection 2.3.3, construction and demolition under Alternative 2 would only occur at FWA. Therefore, potential impacts caused by exposure of existing subsurface contamination during construction and demolition would not occur at FRA or other areas.



LOCATION MAP



LEGEND

- Town
- Proposed Airfield Fencing
- Surface Water
- Railroad
- Proposed Construction/Demolition
- Operable Unit with Proposed Construction/Demolition Overlap
- Operable Unit
- Installation Boundary
- Existing Building
- Ladd Army Airfield Movement Area
- Single Rotar Helicopter (Blackhawk and Kiowa)
- Double Rotar Helicopter (Chinook)

NOTES:
1. For detailed restoration site summaries, see Figure 3.5.a
2. For specific information on construction/demolition under Alternative 2, see Figure 2.5.b

N

0 1,250 2,500 Feet

1 inch = 1,300 feet

FIGURE 4.5.a
Restoration Sites with New Construction and Demolition at Fort Wainwright with Alternative 2
USARAK Aviation EIS

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Hazardous materials and hazardous waste (such as paint, glue, chemical finishes, and fuel) would likely be used and generated during construction of the facilities. Importation of these hazardous materials would have a potentially adverse impact, increasing the quantity of hazardous materials and hazardous waste, primarily on the installation (and not the training areas). The largest indirect impact of concern is the increased risk of exposure and endangerment of the public through storage, transportation, and use of hazardous materials. Additionally, larger volumes of hazardous substances could increase the likelihood of contamination, such as spills or releases to soil and water bodies. USARAK would continue to use existing (or expanded) control measures to accommodate the increased quantities of hazardous materials and hazardous waste on the installation.

Continued recycling of hazardous waste would accommodate the increased generation during construction of the facilities. During construction and operation of Garrison facilities, and during UXO clearance activities, USARAK Garrisons and their contractors would adhere to existing SOPs and USARAK Pamphlet 200-1, *Hazardous Materials and Regulated Waste Management*, for the handling and transfer of hazardous materials and hazardous wastes, and comply with all occupational health and safety standards. In accordance with USARAK Pamphlet 200-1, the Army or the contractor would require the implementation of proper management, use, and disposal plans individualized to the specific site and construction. While there are no known constraints on waste management (Gray, 2009, personal communication), USARAK recognizes that additional amenities may be necessary to facilitate proper management of hazardous materials and hazardous waste and would accommodate accordingly. For example, hazardous materials and hazardous waste generated from construction activities could require storage until it could be transferred to a disposal site. Additional storage space would be provided and storage issues would be incorporated into the construction guidelines and regulations for environmental practices. For specialized construction (such as a petroleum, oil, and lubricant [POL] utility line), USARAK Pamphlet 200-1, *Hazardous Materials and Regulated Waste Management*, would require the enforcement of spill control response and prevention plans. Continued adherence to applicable regulations and management plans would result in less-than-significant adverse impacts related to increased risk of spills or releases (including water bodies), increased generation of hazardous wastes, and exposure or endangerment of the public.

USARAK would work to minimize all impacts associated with the new facilities. Site selection for the new buildings would avoid locations with existing contamination that are currently undergoing remediation. In addition, the Army has established an SOP and GIS-based tracking system to ensure that land and use restrictions are enforced. This IC system has been incorporated into the post-wide *Master Plan* and compliance with ICs is reported in the *Annual Monitoring Reports* for each operable unit (OU). The IC policy applies to all USARAK units and activities, military and civilian support activities, tenant organizations and agencies, and government and civilian contractors. The Environmental Protection/ Environmental Compliance (GC Policy #22-39) Memorandum, signed by Colonel Lehman in February 2003 (USARAK, 2003b), includes the Institutional Controls Memorandum, signed by Major General Lovelace in February 2002 and the Institutional Controls Memorandum signed by Major General Cash in February 1999. The memorandums require Work Authorization Permits for all soil and groundwater on USARAK lands. A section covering areas with ICs mandated by a ROD, and a section covering areas where

contamination is not suspected are included. All contracts that include intrusive activities require the Work Authorization Permit, which will alert involved parties of the potential for encountering contaminated soil or groundwater and will include appropriate procedures to follow if contamination is encountered.

Pre-construction Environmental Surveys (PES) are conducted prior to any construction-related activities. Results of the PES conducted for components of the Proposed Action are discussed below. When siting of facilities in a contaminated area is unavoidable, early and rigorous consultation between the Army, U.S. Environmental Protection Agency (EPA), and Alaska Department of Environmental Conservation (ADEC) would be completed prior to the start of new construction. Through this consultation process, funding requests for cleanup of contaminants, commitments for continued (or increased) environmental monitoring, and other required changes can be accomplished in accordance with the Federal Facility Agreement (FFA).

Although thorough siting analysis was conducted for each construction activity, siting some aviation facilities in contaminated areas was unavoidable. The new construction projects associated with Alternative 2 that have the potential to be sited in areas of known contamination are as follows:

Airfield Perimeter Fence – This fence would encircle the entire Ladd AAF (see Figure 4.5.a), passing through three sites designated under CERCLA with corresponding RODs (Operable Unit [OU]1, OU3, OU5) and two-party source areas, all identified under the FWA FFA. Additionally, two pipelines may be encountered during the fence installation, including one diesel pipeline along Meridian Road and another pipeline running along the north side of the airfield known to have contained gasoline. These pipelines are suspected to be between the ground surface and approximately 6 inches below the surface, and the area of their possible location would need to be "cleared" prior to the construction of the airfield perimeter fence. The PES for the Airfield Perimeter Fence concluded that areas along the fence route either have known contamination or there is a strong suspicion contamination from leaks, weeps, and unreported spills could be encountered during construction (U.S. Department of the Army, 2009a). The contamination is expected to be limited to superficial POL. Because there is no practicable alternative route for the airfield perimeter fence that would avoid known areas of contamination, the PES recommended the route be approved without further investigation. The potential to encounter POL contamination is considered within the capability of the project and Garrison to manage (U.S. Department of the Army, 2009a).

Aircraft Parts Storage Facility – This facility is currently sited in an area of known past POL contamination. The siting would be on the former site of Buildings 2080 and 2077, both of which are part of the two-party agreement with the State and considered part of OU5. The PES for the Aircraft Parts Storage Facility concluded that the site has known contamination (U.S. Department of the Army, 2009a). Further investigation is being conducted in the summer of 2009 to delineate and characterize the location and concentration of any contaminants with respect to facility layout and foundation design. The site was recommended for approval for construction because of the nature of the contamination and the Garrison's capability to manage contamination that may be encountered during construction. Any media excavated for the construction of this facility found to contain greater than 20 parts per million (ppm) POL would need to be placed in a contractor built

temporary contaminated soil storage cell, and disposed of in accordance with State and federal regulations. The potential to encounter undocumented benzene exists at this site. If benzene is sampled for, and is found to be at threshold levels, actions would need to be coordinated through the processes outlined under Resource Conservation and Recovery Act (RCRA). This site has numerous monitoring wells currently in place. Once the new facility construction has been completed, the wells would need to be replaced through a U.S. Army Environmental Command (USAEC) funding mechanism.

Vehicle Maintenance Facility/TEMF – The PES for the Vehicle Maintenance Facility/TEMF concluded that the site is a Category II, with no known contamination; however, there remains some potential that contamination may be encountered during construction (U.S. Department of the Army, 2009a). The site was previously used as a training area and there is evidence of vehicular traffic and wood-cutting activities. While no record of a release was discovered, it is likely that leaks, weeps, and minor unreported spills may have occurred during the training. There is also the potential that contamination from nearby contaminated sites (i.e., former fire training pits and Buildings 2106 and 2108) may be encountered during construction. Any contamination encountered is expected to be limited to superficial POL. The PES recommended the site be approved for construction without further investigation (U.S. Department of the Army, 2009a).

Demolition of Buildings 3011, 3475, and 3477/Organizational Parking Area – These buildings sit on top of known contaminants and are currently classified as "No Further Action" sites under the CERCLA RODs governing the area. The PES concluded that known minor contamination and other recognized environmental conditions are present and lead to the strong suspicion that contamination would be encountered during construction (U.S. Department of the Army, 2009c). Several spills in the area of Building 3475 and 3477 were cleaned up; however, it is likely that unreported spills have occurred prior to the implementation of ICs and spill reporting systems. The extent of the potential contamination cannot be determined until demolition of Buildings 3475 and 3477 has occurred. It is expected that contamination will be localized and within the capability of the project and Garrison to manage. The site was recommended for construction with the understanding that further investigation is necessary to determine the presence or absence of contamination and to perform required cleanup and remediation (U.S. Department of the Army, 2009c). Funding of additional investigations and disposal of investigation-derived waste from the area has been obtained.

Helicopter Parking Apron – This apron is located on the airfield between the proposed Chinook and Kiowa hangars (see Figure 4.5.a) and is part of OU5. Since 1949, the site has been used for activities consistent with airfield operations, such as aircraft and vehicular traffic. The site is located near areas of known contamination (Buildings 2111 and 2112, approximately 800 feet north of the site) and there is potential that contamination would be encountered during construction. The potential is considered low because the results of a chemical analysis of soil borings taken from the site were below detection limits. The PES concluded that there is no record of release in the area; however, it is likely that leaks, weeps, and minor unreported spills may have occurred. Any contamination encountered is expected to be minor and limited to superficial POL. The site was recommended for approval for construction without further investigation. The potential to encounter POL

contamination is considered minor and within the capability of the project and Garrison to manage (U.S. Department of the Army, 2009b).

Barracks (294 person) – The PES for the Barracks (294 person) concluded that there is no known contamination on the site; however, there remains some potential that contamination may be encountered during construction (U.S. Department of the Army, 2009a). The site was formerly used as an ammunition and ordnance storage facility and had associated vehicular traffic. While there was no record of release in the area, it is likely that leaks, weeps, and minor unreported spills may have occurred. Any contamination encountered is expected to be minor and limited to superficial POL. The site was recommended for construction without further investigation (U.S. Department of the Army, 2009a).

Organizational Storage Building – The PES concluded that, while there was no record of a release, it is likely that leaks, weeps, and minor unreported spills may have occurred during the site's historical use as a training area and because of vehicular traffic at the site. Any contamination encountered is expected to be limited to superficial POL. While there is some potential to encounter POL contamination during construction, the potential is considered minor and within the capability of the project and Garrison to manage. The site was recommended for construction without further investigation (U.S. Department of the Army, 2009b).

Recreational Vehicle Parking Replacement – The PES for the Recreational Vehicle Parking Replacement area concluded that the site has no known contamination; however, some potential remains that contamination may be encountered during construction (U.S. Department of the Army, 2009b). The site was formerly used as a coal stockpile area and had evidence of vehicular traffic. There are no records of a release in the area; however, it is likely that leaks, weeps, and minor unreported spills may have occurred. Any contamination encountered is expected to be limited to superficial POL. Therefore, the site was recommended for construction and no further investigation was recommended (U.S. Department of the Army, 2009b).

Brigade HQ with SCIP and BOF – The site is currently used as an athletic field. Historical records show that the site was formerly a parade field and was used for organizational parking. According to the PES, the site was associated with the "Southgate Road Tar Site" west of the FWA South Post Soccer Field. The Southgate Road Tar Site was one of four known sites used for burying tar at FWA. Tar was dumped at the site in 40-pound wooden kegs, which have likely decayed. While tar is not a hazardous substance or a petroleum product, it was often mixed with petroleum products for a thinner consistency. While unlikely, it is possible that tar cut with petroleum products exists on the site. Former use of the site for organizational parking presents the likelihood that past releases have occurred (U.S. Department of the Army, 2009d).

While the site has no known contamination, there is a low potential that contamination may be encountered during construction (U.S. Department of the Army, 2009d). The site was approved for construction without further investigation. Any contamination is expected to be minor and limited to superficial POL. Tar is not a hazardous substance and is not POL. If encountered, it would be addressed as solid waste (U.S. Department of the Army, 2009d).

Under Alternative 2, adverse impacts related to explosions, spills, releases, and other impacts to contaminated sites could occur as a result of construction and demolition. USARAK would continue to coordinate with regulatory agencies to ensure compliance with all applicable regulations for investigation and corrective action in these areas. Continued compliance would reduce adverse impacts to a less-than-significant level.

Operations and Maintenance

The O&M of the newly constructed facilities and increased aviation assets would change the present hazardous materials and hazardous waste conditions in the study area locations. The operation of new helicopter facilities would increase the quantity of hazardous materials procured and subsequent waste generated. Machinery lubricants, cleaning chemicals, paint, petroleum products, and other hazardous chemicals would be used to operate and maintain facilities and aviation assets. Increased quantities of hazardous materials would generate additional hazardous waste and could result in increased risk of endangering the public through storage, transportation, and use. Additionally, the increased quantities would increase the likelihood of a release to the environment, including water bodies, based on the increase in the amount of material being handled, although no new waste streams would be created as a result of implementing Alternative 2.

Adverse impacts would be reduced by continued implementation of the USARAK hazardous waste recycling program to accommodate the increased volume generated by O&M of the newly constructed facilities and increased aviation assets. In addition, USARAK would follow the guidelines of Army Pamphlet 200-1 and FWA ICs, which dictate the proper management procedures for hazardous materials and hazardous waste related to operating and maintaining facilities and aviation assets. The current hazardous materials and hazardous waste management systems, including the regulations pertaining to fueling, would remain in force. They would be expanded and modified, as necessary, to accommodate expansion to a Task Force.

4.5.2.2.4 Military Training

Cantonment

The training programs executed in response to the newly formed Task Force would not increase the risk of exposure to hazardous materials because training activities in the Cantonment are limited to takeoffs and landings. Even with the projected increase in the number of takeoffs and landings, the potential of spills and other hazardous materials impacts is negligible.

Non-Cantonment

The training exercises for the newly formed Task Force in the non-cantonment area would change the existing hazardous materials condition and would result in additional impacts to training ranges. The training exercises would require substantive space and the use of combat equipment (e.g., weaponry, ammunition, explosives, and fuel) to simulate combat or other realistic situations. Increased use of explosives and ammunition within active ranges would occur as part of Alternative 2. The increased Task Force activities pose limited potential for safety impacts outside the preexisting ranges and IAs. Hazardous materials (such as ammunition and explosives) can indirectly affect soil and groundwater contaminant conditions. The Army would continue to manage training exercises in a way that complies with all relevant existing federal and Army regulations as well as applicable

implementing guidance governing the use of hazardous materials and the generation and disposal of hazardous waste.

USARAK Pamphlet 200-1 (USARAK, 2000) and the Army's aviation training plan guidelines provide procedures for hazardous materials use and management. The Army would continue to implement these guidelines, and UXO and firing range safety programs would be modified and expanded to accommodate the new training procedures under Alternative 2. Thorough notification procedures and communication would also be implemented to ensure safety of other military personnel and the public. Adherence to applicable regulations and management plans would result in less-than-significant adverse impacts related to contaminated sites and exposure or endangerment of the public.

4.5.2.3 Alternative 3: Combat Aviation Brigade

4.5.2.3.1 Aviation Personnel

Alternative 3 would increase the number of aviation personnel stationed at FWA to 1,966. Aviation personnel stationed at FRA and Eielson AFB would increase to 442 each (Table 2.5.a). For Alternative 3, the impacts attributable to the increase in aviation personnel would be similar to those for Alternative 2. Because the number of Soldiers (and associated dependents and civilian personnel) would increase under Alternative 3 (compared with Alternative 2), the potential for impacts to occur would increase at a level commensurate with the increase in the population's use of hazardous materials and generation of hazardous waste.

Aviation personnel increases that would occur under Alternative 3 would result in no impacts related to increased risk of explosion or known contaminated sites. Potential adverse impacts including risk of spills or releases to the environment (soil and water bodies), increased generation of hazardous wastes, and endangerment of the public would be reduced to less than significant by expanding Army and USAF hazardous material handling and disposal SOPs to accommodate the anticipated increases. Additionally, existing federal, Army, and USAF regulations and enforcement would continue to address the increased on-installation use and to limit exposure. USARAK would continue to manage hazardous materials using plans (USARAK Pamphlet 200-1) to manage the handling and disposal of hazardous materials and hazardous waste encountered on a more frequent basis. With the increased number of Soldiers, dependents, and civilians, USARAK would expand and accommodate programs to handle the increased volume of hazardous materials and hazardous waste anticipated to occur.

4.5.2.3.2 Aviation Assets

For Alternative 3, the impacts attributable to the increase in aviation assets (helicopters, vehicles, and generators) would be similar to those for Alternative 2. However, because the number of assets is greater under Alternative 3 as compared to Alternative 2, and increased aviation assets also located at Eielson AFB and FRA (Table 2.5.a), the potential for impacts to occur would increase at a level commensurate with the increase in aviation assets and the associated use of hazardous materials and generation of hazardous waste. As with Alternative 2, existing Alaska DoD contracts are in place for disposition, sale, or disposal of the additional hazardous materials and wastes, and no capacity constraints are anticipated at FWA, FRA, Eielson AFB, or DTA for disposition of hazardous materials and wastes.

Continued adherence with applicable federal, Army, and USAF regulations, including expansion of programs to handle increased volumes of hazardous materials and hazardous waste, potentially adverse impacts related to the criterion identified in Table 4.5.a would be less than significant.

4.5.2.3.3 Facilities Construction and Demolition

Similar to Alternative 2, the increased number of aviation assets and supporting personnel would result in the construction of a number of new facilities to support the newly formed Brigade at FWA. A proportional increase in hazardous waste introduction, generation, and exposure as a result of construction activities would likely occur under Alternative 3. Additional facilities to be constructed under Alternative 3 have the potential to impact hazardous waste if sited in areas of known contamination (Figure 4.5.b). Of the 12 additional construction projects proposed under Alternative 3, two facilities have been sited in areas of known contamination and would need to be addressed with regulating agencies prior to any site improvement. Other facilities may be sited in contaminated areas but would require further site investigations to identify the presence or absence of contaminants. The facilities potentially impacted by known hazardous substances are shown on Figure 4.5.b and include the following:

Organizational Vehicle Parking – This site is on Ladd AAF and is co-located with the Aircraft Parts Storage Facility described under Alternative 2. Briefly, this site is in an area of known past POL contamination, with BMPs identified in Subsection 4.5.2.2.3. Investigations of the area, as agreed upon among EPA, Army, and ADEC, would be expanded to include this area if Alternative 3 is chosen.

Vehicle Maintenance Facility – This site is co-located with the Task Force Vehicle Maintenance Facility, COF, and organizational parking identified under Alternative 2. Potential impacts from contamination are expected to be similar to that of the other co-located facilities, and would likely be the result of the past fire training pit located southeast of the site.

Secure Storage Area (SSA) – This site is located east of the Vehicle Maintenance Facility area and may encounter the same hazards associated with past fire pit training areas located southeast of the site.

As described in Subsection 2.3.3, construction and demolition under Alternative 3 would only occur at FWA. Therefore, potential impacts caused by exposure of existing subsurface contamination during construction and demolition would not occur at FRA or Eielson AFB.

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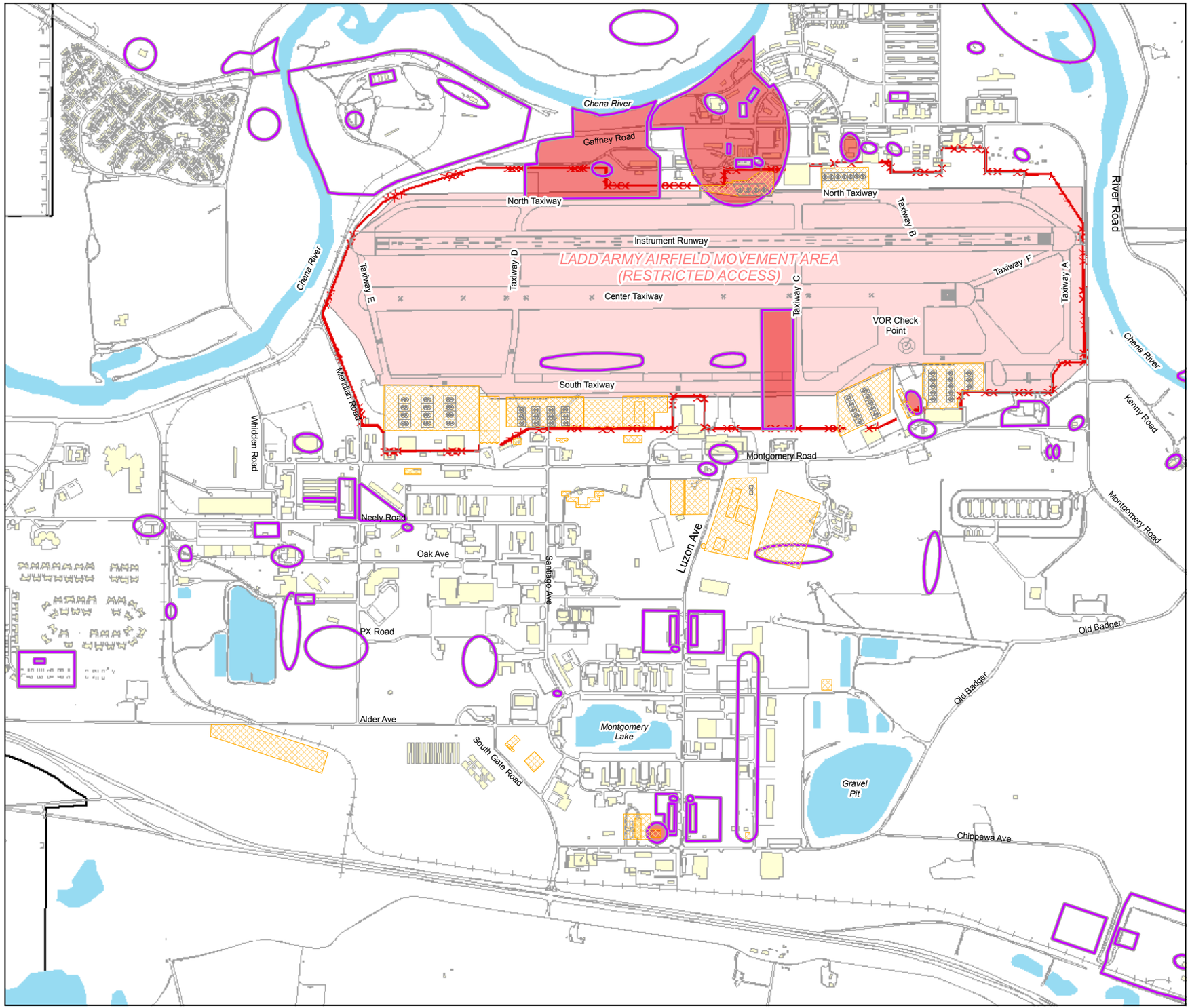
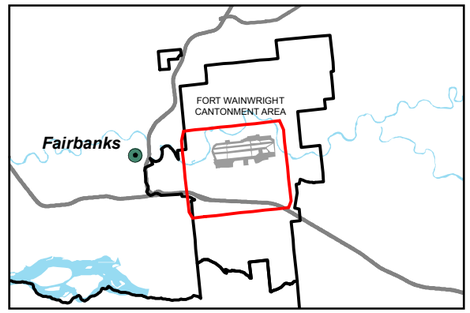


LOCATION MAP



LEGEND

- Town
- Airfield Fencing
- Railroad
- Proposed Construction/Demolition
- Operable Unit with Proposed Construction/Demolition Overlap
- Operable Unit
- Installation Boundary
- Existing Building
- Ladd Army Airfield Movement Area
- Single Rotar Helicopter (Blackhawk and Kiowa)
- Double Rotar Helicopter (Chinook)

NOTES:
1. For detailed restoration site summaries, see Figure 3.5.a
2. For specific information on construction/demolition under Alternative 2, see Figure 2.5.c

N

0 1,300 2,600 Feet

1 inch = 1,300 feet

FIGURE 4.5.b
Restoration Sites with New Construction and Demolition at Fort Wainwright with Alternative 3
USARAK Aviation EIS

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No additional renovation or rehabilitation of current facilities would be attributed to Alternative 3. If facilities at supporting installations were identified for renovation or rehabilitation, then additional environmental analysis would be performed to assess the effects of those actions.

Implementing Alternative 3, therefore, would result in impacts similar to those for Alternative 2; however, the impacts would be at an increased level commensurate with the increase in Soldiers and associated dependents and personnel. The increased quantity of hazardous materials (such as petroleum-based fuel, paint, epoxy, and other compounds used in construction) would result in potentially adverse impacts to the existing hazardous material and waste control systems. Continued implementation of the USARAK hazardous waste recycling program would accommodate the increased volume of waste generated by implementation of Alternative 3. In addition, USARAK would continue to implement appropriate hazardous material and hazardous waste management practices to address the anticipated increased use of hazardous materials and generation of hazardous waste. Continued adherence with applicable federal, Army, and USAF regulations and management plans would result in a less-than-significant impact related to the criterion identified in Table 4.5.a.

4.5.2.3.4 Military Training

The scenario described for Alternative 2 would also apply to Alternative 3. However, the impacts would be at an increased level commensurate with the increase in Soldiers and associated aviation assets. Continued adherence with applicable federal, Army, and USAF regulations and management plans would result in a less-than-significant impact related to the criterion identified in Table 4.5.a.

4.5.2.4 Summary of Impacts

Table 4.5.b presents a comparative summary of how the alternatives relate to the significance criteria presented in Table 4.5.a. Alternatives 2 and 3 do present potentially significant impacts compared to the No Action alternative.

TABLE 4.5.b
Comparative Summary of Impacts by Alternative for Hazardous Materials/Hazardous Waste
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Explosion, Spill, or Release	No Impact. There would be no increased risk for explosions, spills, or release of hazardous materials or waste.	Adverse-Less than Significant Impact. Increased amounts and generation of hazardous substances at FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets, and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.

TABLE 4.5.b
Comparative Summary of Impacts by Alternative for Hazardous Materials/Hazardous Waste
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Spill or Release	No impact. There would be no change to the existing conditions under Alternative 1.	Adverse – Less than Significant Impact. Increased amounts and generation of hazardous substances at FWA. With continued compliance with hazardous materials management plans and applicable regulations, impacts would be less than significant.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets, and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.
Water	No impact. There would be no change to the existing conditions under Alternative 1.	Adverse – Less than Significant Impact. Increased volume and generation of hazardous substances at FWA. This adverse impact would be reduced to less than significant through continued use and expansion of hazardous materials management plans and compliance with regulations.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets, and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.
Contaminated Sites	No Impact. Alternative 1 would not change the impacts related to contaminated sites. Past contamination would remain under CERCLA enforcement.	Adverse – Less than Significant Impact. Earthwork during construction of new facilities would result in impacts to known contaminated sites and the potential exposure of previously unknown subsurface contamination. These are anticipated to be less than significant. Continued adherence with applicable regulations would include compliance with EPA and the State of Alaska for potential construction-related impacts.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets; and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.
Generation	No impact. There would be no increase in the generation of hazardous materials or waste.	Adverse – Less than significant Impact. Construction and training activities would result in the generation of hazardous materials and waste. Continued compliance with applicable federal and Army regulations, and management plans would result in less-than-significant impacts.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets, and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.

TABLE 4.5.b
Comparative Summary of Impacts by Alternative for Hazardous Materials/Hazardous Waste
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Endanger the Public	No impact. There would be no increased risk to the public.	Adverse – Less than significant Impact. Continued compliance with applicable federal and Army regulations, and management plans would result in less-than-significant impacts.	Adverse-Less than Significant Impact. Impacts would be similar to Alternative 2, but would be at an increased level due to the increase in Soldiers and aviation assets, and would involve FRA and Eielson AFB in addition to FWA. Adverse impacts would be reduced to less than significant through continued compliance with hazardous materials management plans and applicable regulations.

4.5.3 Mitigation

Continued compliance with applicable regulations including management plans will result in less-than-significant adverse impacts related to the criterion identified in Table 4.5.a.

All three of the Cantonments identified for potential stationing of aviation assets are bound by FFAs addressing significant contaminant issues and the mitigation plans for remediation and long-term management of those locations. All parties will continue to adhere to the regulations and guidelines outlined in the FFAs as interpreted and disseminated via the installations' ICs. The Army is committed to continuing ongoing monitoring in areas where the presence of contamination is possible but has not been previously identified.

As impacts to some of the federally and State-regulated contaminated sites are unavoidable under either of the action alternatives, negotiations with the regulating agencies over specific Cantonment construction projects will need to take place prior to final siting analysis, project award, and construction of new facilities. Through this process, funding requests for cleanup of contaminants, commitments for continued (or increased) environmental monitoring, and other required changes can be accomplished in accordance with the FFA. Any additional sampling and monitoring of contaminated sites required for construction of new facilities will take place prior to the start of construction.

In addition to the regulations enforced by the EPA and ADEC, USARAK has its own environmental program to dictate and enforce environmental protection and preservation. Many of USARAK's environmental programs and regulations for hazardous materials and hazardous waste can be found in USARAK Pamphlet 200-1, *Hazardous Materials and Regulated Waste Management*. Pamphlet 200-1 governs all aspects of managing hazardous materials and regulated waste by military or civilian personnel and tenants and contractors at Army facilities. Specific regulations generally govern the use, storage, and disposal of hazardous materials and hazardous wastes. Continued implementation of USARAK Pamphlet 200-1 at all installations will ensure impacts of the Proposed Action are reduced in their level of significance to the environment, Soldiers, and supporting personnel.

Ongoing support of lead-based paint (LBP) health effects monitoring at both USARAK installations is performed by U.S. Army Medical Department Activity-Alaska (MEDDAC-AK). MEDDAC-AK will monitor the blood-lead screening program, assist lead toxicity investigations, implement and maintain the blood-lead screening program, and provide notification when elevated blood-lead levels are encountered. MEDDAC-AK will also conduct personnel, workspace, and living space testing when elevated blood levels are encountered. It is the responsibility of USAG-FWA and USAG-FRA to modify design, renovation, construction, and maintenance work practices to protect personnel and contractors from lead exposure as discussed in the USAG-FWA and USAG-FRA *Lead-Based Paint Management Plans* (LBPMPs). Continued implementation of the LBPMP at all installations will ensure that impacts of either Alternative 2 or 3 are less than significant.

USAG-FWA and USAG-FRA Directorate of Public Works (DPW) have the primary responsibility for developing and implementing the asbestos management programs as part of their obligations under the installation AMP, to include asbestos survey data for any building proposed to be demolished under Alternatives 2 or 3. A written "Notification of Demolition and Renovation" shall be submitted to the EPA 10 working days (according to the postmark) prior to any work on an asbestos project begins. MEDDAC-AK is responsible for work site air monitoring compliance and final clearance. The asbestos program coordinator and the installations engineering departments are responsible for quality assurance contract inspection for all asbestos work. Continued implementation of the AMP at all installations will ensure that impacts of either Alternative 2 or 3 are less than significant.

Pest management at all locations analyzed in this EIS will continue to support a healthy living, working, and training environment for USARAK Soldiers, families, and supporting personnel. Continued implementation of the *Installation Pest Management Plan* (IPMPs) at all installations will ensure that impacts of either Alternative 2 or Alternative 3 are less than significant.

Other efforts resulting from non-construction-related activities due to implementation of either action alternative have also been considered. These will be conducted and implemented through continued compliance with applicable federal, Army, and USAF regulations and will include the continued provision of portable containment systems for use at in-field refueling points that will be capable of containing potential fuel releases from fuel tanker vehicles, effectively minimizing the risk of training area contamination from inadvertent petrochemical release. In the event that munitions and explosives of concern are discovered in areas of proposed construction, they will not be disturbed in any way until qualified personnel could dispose of them pursuant to ICs established at all installations.

4.6 Wildlife and Fisheries

This section presents the environmental analysis of potential impacts to wildlife and fisheries as a result of implementing the Proposed Action alternatives. Subsection 4.6.1 presents the significance criteria. Subsection 4.6.2 analyzes the alternatives and provides a summary table. Subsection 4.6.3 discusses possible mitigation measures.

4.6.1 Significance Criteria

The analysis of impacts on wildlife and fisheries was based on a review of readily available existing wildlife data, planning documents, a literature review of effects of helicopters on selected wildlife species (Anderson, 2007), and professional opinion. No original baseline data collection was undertaken as part of this EIS.

All direct and indirect impacts to wildlife and fisheries were considered qualitatively in this analysis, as few quantitative data are available. For analyses, it was assumed that the extent of training area and flight corridor use are the proposed activities that have the most potential to impact wildlife and fisheries.

The evaluation criteria for wildlife and fisheries include those for disturbance, displacement, and mortality (see Table 4.6.a). These criteria are the basis of the significance criteria used to assess the potential impacts of the action alternatives compared with the No Action alternative. Subsection 4.6.2.4 provides a summary of an analysis of alternatives compared to the significance criteria.

TABLE 4.6.a
Wildlife and Fisheries Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Disturbance	Changes in behavior that result in long-term or permanent changes of population use of habitats. Behavioral reactions that result in physiological stress that substantially affects productivity or survival. Less-than-significant impacts would be any changes in behavior not resulting in long-term or permanent changes of population use of habitats and behavior reactions that did not result in a level of physiological stress that substantially affected productivity or survival.
Displacement	Changes in habitat use that result in permanent displacement of populations from current range or shifts in habitat use that result in substantial decreased productivity or survival. Less-than-significant impacts would be temporary displacement of populations or temporary changes in habitat use, which did not lead to a substantial decrease in productivity or survival.
Mortality	Increases in species mortality rates from project activities that jeopardizes sustainable regional populations or adversely affects wildlife management goals for populations. Less-than-significant impacts would include either no mortality or such limited mortality that it did not affect the regional population or affect wildlife management goals for that species.
Protected Species	Direct mortality of protected species from project activities, or adverse effects of project activities on survival, reproduction, and/or productivity of protected species. Less-than-significant impacts would occur if no mortality occurred from project activities or if activities did not adverse affect survival, reproduction, and/or productivity.

4.6.2 Environmental Consequences for Wildlife and Fisheries

For wildlife and fish populations, the primary impacts of Alternatives 2 and 3 are contingent on the extent of training-area and flight-corridor use. Construction occurring on FWA's Main Post and O&M of the facilities would have no effect or very low effects on wildlife and fish populations because these activities would occur in areas already subject to significant human disturbance and little wildlife use. Fish populations are unlikely to be affected by

helicopter training, unless fish-bearing streams or other water bodies are contaminated by munitions (see Section 4.10). Therefore, fisheries are not evaluated further in this EIS.

Wildlife populations that could be affected by Alternative 2 or Alternative 3 are the focus of this analysis, specifically the potential effects to wildlife from varied helicopter operations at the training areas and in the flight corridors connecting the facilities and the training areas at FWA, FRA, Eielson AFB, and the DTA. These differences in helicopter use of the training areas, expressed as differences in peak daily use and total annual operations, are summarized in Section 2.5, Alternatives.

As discussed earlier, an analysis of impacts to terrestrial threatened or endangered species listed under the Endangered Species Act is not included in this EIS because 1) no listed threatened or endangered species occur on USARAK lands, and 2) no concerns were raised about threatened and endangered species during public scoping meetings.

Because of the special protections afforded bald and golden eagles by the Bald and Golden Eagle Protection Act, this EIS does analyze the impacts associated with the Proposed Action alternatives to determine whether eagles would be adversely affected by the various project activities.

For these analyses of environmental consequences, the focus is on those species identified as being indicator species: caribou, moose, bison, Dall sheep, brown and black bears, beluga whale (Alternative 3 only), raptors, migratory waterbirds, sandhill cranes, and neotropical migratory birds (see Subsection 3.6.2). Species identified as sensitive species, species of concern, or priority management species by the Army are included in the environmental consequences discussion where warranted based on their probability of adverse effects related to the various alternatives. For the purposes of analyses, the peak daily helicopter operations are used as a conservative (or worst case) scenario for assessing impacts on the selected species because this would represent the highest levels of disturbance likely to occur during major training events.

Environmental consequences for wildlife associated with the various alternatives can result from the operations of helicopters, use of military ordnance (munitions), convoying of ground vehicles between FWA and DTA, increases in vehicles at FWA, and changes in habitats from the use of munitions or helicopter landings. The effects of helicopters on wildlife can be either direct (e.g., injuries or mortality, behavioral disturbance, displacement from habitats resulting from the helicopter overflight) or indirect (e.g., long-term shifts in habitat use after repeated temporary displacement, physiological changes due to repeated stress, long-term changes in behavior in areas subject to frequent overflights). The effects of helicopter overflights on different wildlife species are variable among species. In addition, such effects can differ depending on the season of the year (e.g., reproductive season versus winter or migration versus nesting). *A Literature Review of the Effects of Helicopter Disturbance and Noise on Selected Wildlife Species* (ABR, Inc., 2007) provides an overview of the relevant literature and describes the effects of helicopters on many of the selected wildlife species.

4.6.2.1 Alternative 1: No Action

4.6.2.1.1 Aviation Personnel

Under the No Action alternative, no increase in Soldiers, dependents, or civilian personnel would occur. No changes in wildlife populations or habitat use would occur under the No Action alternative; thus, the impacts would be less than significant.

4.6.2.1.2 Aviation Assets

Under the No Action alternative, no increase in aviation assets (helicopters, vehicles, generators) would occur. No changes in wildlife populations or habitat use would occur under the No Action alternative; thus, the impacts would be less than significant.

4.6.2.1.3 Facilities Construction and Demolition

Under the No Action alternative, no new facilities would be constructed and no facilities would be demolished. No changes in wildlife populations or habitat use would occur under the No Action alternative; thus, the impacts would be less than significant.

4.6.2.1.4 Military Training

The number and frequency of training exercises would remain close to current projected numbers under the No Action alternative. The existing baseline populations of wildlife would experience the direct and indirect effects of helicopter training as they currently exist. No changes in wildlife populations or habitat use would occur under the No Action alternative; thus, the impacts would be less than significant.

4.6.2.2 Alternative 2: Aviation Task Force

Under Alternative 2, the peak number of daily helicopter operations would increase overall from the levels under the No Action Alternative. Environmental consequences to wildlife populations from Alternative 2 would primarily occur as a result of increases in disturbance from helicopter overflights in FWA and along the FWA flight corridors to DTA and TFTA (those consequences are discussed below in Subsection 4.6.2.2.4).

4.6.2.2.1 Aviation Personnel

The primary impacts to wildlife due to increases in aviation personnel and other support personnel would be from impacts associated with recreational activities (e.g., hunting, fishing, camping, wildlife viewing) on the installations and in nearby areas. Increases in vehicles on Post and on the local roads might increase the potential for wildlife-vehicle collisions, particularly with moose. Increases in hunting efforts in the Game Management Units (GMUs) near FWA would be expected to increase with additions in personnel at the Post. Current State hunting regulations and permit requirements, and proper educational training of personnel, would likely mitigate this impact on large mammals, such as moose, bears, caribou, and Dall sheep. The impacts for this project activity would be less than significant because the increases in personnel would not result in adverse changes in wildlife populations (through disturbance, displacement, or mortality).

4.6.2.2.2 Aviation Assets

The effects of increases in aviation assets at FWA would result in minimal impacts to most wildlife other than through minor losses of habitat required by the construction of additional facilities (see Subsection 4.6.2.2.3). Most of the effects on wildlife of increased numbers of helicopters would occur during the military training operations (see Subsection 4.6.2.2.4) and less so from normal maintenance and housing of equipment. Some short-term increases in disturbance (noise and visual) to birds near the airfield and hangars would occur during ground operations of the helicopters (engine tests) and short-distance flights at the airfield during flight proficiency training. Increases in the number of generators and ground vehicles would increase noise levels somewhat, but as these are located within the Cantonment, the increases would likely have minimal effects on wildlife populations. The impacts of aviation assets on wildlife would be less than significant because the impacts described above would involve only minor loss of habitat that would not affect the long-term population use of habitats in the region. Any disturbance or displacement would likely be of short duration and temporary, and increases in mortality would be unlikely.

4.6.2.2.3 Facilities Construction and Demolition

Under Alternative 2, impacts associated with construction projects would be confined primarily to the cantonment areas where little wildlife is located. Thus, no adverse short- or long-term impacts on wildlife populations would occur under this alternative. Incorporation of a design consultation by FWA environmental office prior to finalization of construction documents would reduce the potential for issues with bird nesting on new buildings and structures, which would reduce or eliminate future issues related to Migratory Bird Treaty Act requirements to protect nesting birds. During construction, all activities would comply with the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act. To the greatest extent practicable, the project activities would avoid clearing vegetation during the U.S. Fish and Wildlife Service (USFWS) Region 7 date guidelines for Interior Alaska (May 1 – July 15). Additionally, the Army would suggest construction practices are employed to discourage bird nesting in dirt piles (covering piles to discourage nesting bank swallows) and in checking or covering equipment would further reduce bird nesting issues on the Post. Furthermore, the Army would survey construction sites, based on USFWS criteria, to ensure construction and occupancy of facilities would not impact eagle nesting and feeding habits. Overall, facilities construction and demolition would have less-than-significant impacts on wildlife because any loss of habitat from new facilities would be unlikely to result in long-term population changes to wildlife species and any project-associated disturbance or displacement would be temporary. Adherence to the Army management practices in regards to protected species (eagles and migratory birds) would limit the potential for adverse impacts to protected species that would affect productivity or survival; thus, impacts would be less than significant for those species.

The O&M of the newly constructed facilities and increased aviation assets would be unlikely to adversely affect wildlife populations as these activities would occur primarily within the existing Cantonments where minimal wildlife occur. Thus, the impacts during O&M would be less than significant for wildlife.

4.6.2.2.4 Military Training

A Bird Air Strike Hazard (BASH) Program has been implemented at FWA and FRA to minimize the risk of bird/aircraft strikes. Bird strikes on aircraft are an increasing problem worldwide. In response, Army airport managers have developed management strategies that attempt to control birds and to predict periods of increased risk. Understanding bird movements and habitat use on and near airfields has proven to be imperative to limit bird/aircraft conflicts and is likely to be most effective when related to a specific airfield.

Airfields

Disturbance to wildlife associated with helicopter training exercises at the Ladd AAF would likely be minimal because those areas already experience high levels of human use and have a well-developed infrastructure and, therefore, support minimal wildlife populations. The existing fence around the Post and the proposed airfield fence also reduce the likelihood of large mammals encroaching on the airfield. A few moose that might be resident within the Post boundaries could experience low levels of disturbance from noise and overflights, but they likely are already habituated to high levels of human disturbance. Activities at the airfields would result in impacts that were less than significant for wildlife populations because they would not cause permanent shifts in habitat use and disturbance and/or displacement would be temporary and of short duration.

Flight Corridors (FWA-TFTA/YTA and FWA-DTA)

The relative levels of effects on wildlife of helicopter overflights within the flight corridors and training exercises in areas outside the Cantonment would vary by species based on the species-specific sensitivity to disturbance and distribution with the habitats being affected.

Moose

A study of the effects of military-training activities on moose in Norway (Andersen et al., 1996) found that adult moose exposed to military helicopters, jets, and live-fire exercises showed some short-distance movements and heart rate increases during low-level helicopter overflights, but few long-term impacts on populations or changes in range use were apparent. This Norway study focused on adult moose without calves; thus, the limited responses shown to military aircraft and activities are probably less than would be exhibited by moose cows and calves, which are more sensitive to disturbances of all kinds. The most vulnerable period for moose within the flight corridors would be during the calving season (early-mid May), when young calves are present. The flight altitude used by helicopters within the flight corridors (minimum of 500 feet AGL) would limit the noise levels associated with overflights and help minimize disturbance to moose that might be within the corridor. Moose populations in the FWA-TFTA-YTA flight corridors are already subject to frequent helicopter overflights; therefore, the proposed small increases in helicopter operations for this alternative would have minimal effects on moose populations given that the numbers of individual moose affected by direct helicopter overflights would be limited. Monitoring of moose populations over the last few years (during temporary stationing of ATF) has indicated no change from previous herd health, reproduction, or movement. Therefore, no changes are expected from permanent stationing. The overall effects of Alternative 2 on moose populations would be limited and have no effect or very low effects. The Army will continue to implement AR 350-2, which includes guidelines for the avoidance of harassment of wildlife. Thus, the impacts to this species would be less than significant because they would not result in long-term population changes in habitat use,

would not substantially affect productivity or survival, and any disturbance or displacement would be temporary.

Caribou

Because caribou are limited in their distribution along the flight corridors between the FWA and the TFTA, YTA, and DTA, the effects of helicopter operations in those areas would have no to minimal effects on caribou, and the impacts would be considered less than significant.

Dall Sheep

Few, if any, Dall sheep would be affected by helicopter overflights within the flight corridor between FWA and DTA. The higher altitudes (500 feet minimum) of helicopters in the flight corridors would minimize disturbance to any Dall sheep, which are sensitive to helicopter overflights at low altitudes (less than 200–500 feet) (Frid, 1999, 2001, and 2003; Lawler et al., 2004). Because disturbance and/or displacement would be temporary and habitat use would likely not be affected, the overall impacts would be less than significant.

Bison

The FWA-DTA flight corridor could cross over areas used by the Delta bison herd, which ranges across the military lands of the DTA and in the adjacent Delta area. This herd has experienced long-term exposure to both civilian and military aircraft in the region and the herd appears to have habituated to most aircraft commonly using the area (Fancy, 1982). The higher altitudes (500 feet) of helicopters traversing the flight corridor should minimize the potential for disturbance of bison where the corridor intersects their range. The lack of long-term changes in population use of habitats and the temporary nature of any disturbance or displacement of bison indicate that impacts of this activity would be less than significant.

Brown and Black Bears

The flight corridors between FWA-TFTA/YTA and between FWA-DTA do not cross large areas of potential brown or black bear habitats. Thus, only a few brown and/or black bears are likely to occur within the flight corridors, thereby reducing the likelihood of disturbance by helicopters traversing the corridor. The environmental consequences of helicopter overflights in the corridors would be minimal for bears. The overall impacts are less than significant because they do not result in long-term changes to bear populations and any disturbance or displacement from helicopter overflights would be both temporary and of short duration.

Birds

Reactions of birds to helicopter disturbance and noise are highly variable. Some waterfowl species are highly sensitive to helicopters (e.g., brant), while others are relatively less sensitive (e.g., swans). Birds at nests also tend to be more sensitive to disturbance by helicopters than foraging or flying birds or during the non-nesting season.

Migratory Waterbirds

Migratory waterbirds use the Tanana River and adjacent valley as a migration corridor during spring and fall. Thus, the flight corridor between FWA and DTA is in an area where migrating waterbirds, including trumpeter swans, would be encountered during spring and fall migration. Many migratory waterbirds also fly westward along the Tanana River and over the Tanana Flats, which brings them across the helicopter flight corridor between FWA and the TFTA. The timing of waterbird migration in spring and fall is relatively predictable,

and avoidance of migration periods can be accomplished by proper scheduling of training activities. Overall, the minimal increases in helicopter operations in the flight corridors between FWA and the training areas as proposed for Alternative 2 would have minimal impacts on migratory waterbirds. For those species of waterbirds that nest in the TFTA, the helicopter overflights along the FWA-DTA corridor would have minimal impacts because few birds nest in this relatively narrow corridor; however, the multiple corridors between FWA and TFTA encompass a large amount of habitats that may support nesting waterbirds, such as trumpeter swans. However, the flight altitudes of helicopters within the flight corridors would tend to minimize disturbance to nesting waterbirds; thus, the environmental consequences for nesting waterbird populations would remain at a minimal level. Overall, the impacts of helicopter use of flight corridors would be less than significant for migratory waterbirds because of the limited and temporary nature of any adverse effects on migratory waterbirds behavior or habitat use.

Raptors

Bald eagles are the primary raptor of concern within the flight corridors between FWA-TFTA and DTA because they are known to nest in trees adjacent to the Tanana and Salcha rivers. The *National Bald Eagle Management Guidelines* (USFWS, 2007) suggest that helicopter flights be avoided within 1,000 feet of bald eagles nests. Disturbance of bald eagles within the corridor could possibly result in eagles flushing into the flight paths of helicopters traversing the corridor and increasing the potential for bird-aircraft collisions. Studies of bald eagles have shown them to be sensitive to low-level flights of helicopters both during winter and when nesting (Grubb and King, 1991; Watson, 1993; Grubb and Bowerman, 1997; Stalmaster and Kaiser, 1997). Bald eagles in Arizona showed an increased frequency of visible responses (23–61 percent) and frequency of flight (2–13 percent) to aircraft overflights during the nesting season compared to other times of the year (Grubb and Bowerman, 1997). Distance from eagle to aircraft, duration of overflight, and number of aircraft and/or passes were the most important characteristics influencing eagle response in the Arizona study. Grubb and King (1991) found that 47 percent of 718 helicopter disturbances, elicited a response from bald eagles, but most responses were of short duration (<1 min.). Watson (1993) conducted a study of helicopter disturbance of nesting bald eagles in the Puget Sound area and found that bald eagles were disturbed at higher rates when no young were present in the nest, when the eagles were perched <60 meters from the nest, or when the helicopter hovered rather than flew toward the nest. The distance at which eagles flushed appeared to be influenced most by the distance of the eagle to the nest and the distance of the helicopter to the nest. The study also found that the presence of young in the nest increased the tenacity of adult eagles and reduced the tendency to flush when disturbed. Stalmaster and Kaiser (1997) studied flushing responses of wintering bald eagles to military firing activity, helicopter overflights, and boating on the Fort Lewis Army Reservation and found that 37–47 percent of wintering eagles responded to helicopter overflights. They also noted that sub-adult eagles flushed more often than adults, and eagles feeding or standing on the ground flushed more often than those perching in trees.

These studies suggest that the response of bald eagles to helicopter overflights can vary both seasonally and in terms of level of response. Conversely to what might be expected, the studies also suggest that bald eagles at nests may actually be less likely to flush due to helicopter disturbance than birds away from nests. Avoidance of nesting areas used by eagles would limit the exposure of both the eagles to disturbance and reduce the potential

for any helicopter-eagle encounters within the flight corridors. Environmental consequences of this alternative on raptors, particularly bald eagles, would likely be minor to moderate for the eagle population, as large numbers of eagles are unlikely to be affected by overflights that are of short duration and, thus, impacts would be considered less than significant. However, the impacts to bald eagles from helicopter flights along the corridor could rise to a significant level if the helicopter flights adversely affected the reproduction and productivity of this protected species (see significance criteria in Table 4.6.a). These potential significant impacts could be reduced or eliminated, however, by implementing several mitigation measures. Proposed mitigation measures that would deal with these issues include a survey to locate raptor nests and an educational program for pilots to increase awareness and provide guidelines on how to avoid potential encounters with eagles (see Subsection 4.6.3).

Known peregrine falcon nests are located near the flight corridor between FWA and DTA, particularly along the Tanana River bluffs south of Eielson AFB. The peregrine falcon, considered a sensitive species by the Army, tends to stick close to the nest even when approached closely by helicopters (White and Sherrod, 1973). Recent studies in Alaska of peregrine falcons subjected to low-level jet overflights and noise have found this species to be surprisingly tolerant of these short-duration noise events (Murphy et al., 2001, 2002; Palmer et al., 2002, 2003). A study of the reactions of peregrine falcons to experimental helicopter flights on the Alaska North Slope also found limited reactions, except to the closest overflights (Ritchie, 1987). These studies suggest that environmental consequences of this alternative from disturbance of nesting peregrines by helicopters traveling the FWA-DTA corridor are likely to be minimal, particularly if helicopters avoid flying near known nesting sites during the summer breeding season (May–July). Overall, the impacts are less than significant for this species because the helicopters are unlikely to closely approach nesting peregrines and, thus, would not cause any adverse changes in behavior or adversely affect the reproductive activities or productivity of this sensitive species.

Sandhill Cranes

Sandhill cranes occur in large numbers during spring and fall migration in the Tanana River valley, including the FWA, YTA, TFTA, and DTA. Although actively migrating sandhill cranes do appear to be somewhat tolerant of flying aircraft, including helicopters, they are more sensitive to overflights while roosting on the ground (Kessel, 1979). Sandhill cranes also are most likely to encounter military aircraft using the flight corridor between FWA and DTA. The end of the flight corridor near DTA would be the most likely area with the greatest probability of interactions between helicopters and large flocks of cranes. The environmental consequences of increases in helicopter flights along the flight corridor between FWA and DTA would be greatest during the peak periods of crane migration (mid-April to early May, early to mid September). Overall, the minimal increases in helicopter operations in the flight corridors between FWA and the training areas as proposed for Alternative 2 would have minimal impacts on sandhill cranes. The impacts of helicopter overflights in the flight corridors would have less-than-significant impacts on sandhill cranes based on the significance criteria (Table 4.6.a) as no long-term changes in population use of habitats would likely occur and any disturbance or displacement of cranes would be temporary and of short duration. Productivity of sandhill cranes also would not be affected because only a few cranes are likely to nest in habitats below the flight corridors.

Neotropical Migratory Birds and Other Sensitive Species

Neotropical migrants are unlikely to be affected by the increased helicopter operations along the flight corridors between FWA and the training areas associated with Alternative 2. These species, which are well dispersed in the training areas and along the flight corridor, are unlikely to have population-level impacts from intermittent disturbance associated with the helicopter overflights; thus, the overall impacts are less than significant.

Training Areas and Facilities

A following discussion focuses on the activities taking place within in the training areas (see Figures 2.3.b, 2.3.c, and 2.3.d), which includes helicopter movements, low-level flying and hovering, and ground-training exercises within the training areas and facilities. Much of the previous discussion concerning environmental consequences of helicopter use of the flight corridors is also pertinent to helicopter activities in the training areas and, thus, would not be repeated in the discussion below.

Moose

As discussed in the flight corridors section above, adult moose moved short distances and showed heart-rate increases during low-level military helicopter overflights in Norway, but few long-term impacts on moose populations or changes in range use were apparent (Andersen et al., 1996). Moose cows and calves, which are more sensitive to disturbances of all kinds, are likely to respond more strongly to low-flying helicopters within the training areas, particularly in the TFTA, which is a high-density calving area. The most vulnerable period for moose would be during the calving season (early-mid May), when young calves are present. Unlike in the flight corridors, where a minimal flight altitude is required, within the training areas helicopters can fly at any altitude and hover low to the ground during training. The Army will continue to implement AR 350-2, which includes guidelines for the avoidance of harassment of wildlife. Additional guidelines addressing helicopter hovering during calving and breeding seasons may be identified after helicopter training associated with the Proposed Action alternatives is conducted and moose responses are observed. If these types of training activities appear to impact moose populations on USARAK training lands, additional studies of helicopter activities influences on moose behavior should be undertaken.

Low-flying and hovering helicopter operations increase the potential for moderate to severe responses of any moose cow and calves in the immediate vicinity. Although the total number of cows and calves likely to be affected by training exercises may not be sufficient to result in a population-level affect the relative environmental consequences of these activities on moose would be higher than experienced for the flight corridors during the early spring. Many of the potential effects of helicopter training on moose are mitigated by the training restrictions the Army currently has in place to restrict training during the calving season, particularly in the TFTA. Disturbance reactions of moose to low-flying helicopters during other times of the year may be more variable, but during periods when moose are under physiological (rut) or nutritional stress (winter) the effects of helicopter activities could be more detrimental than during other periods. Over the entire year, the overall effects of Alternative 2 on moose populations in the training areas would be limited and have a minimal to minor effect and the overall impacts of this project activity would remain less than significant.

Additional observations will be incorporated into ongoing monitoring to determine whether heard health, reproduction, or movement have changed as a result of helicopter training. A moose migration study will be conducted on TFTA.

Moose are unlikely to remain in the immediate vicinity of any ground-training exercises, including munitions use, gunnery exercise, and use of ground vehicles and troops. Moose are likely to move out of areas experiencing increased training activity while those activities are occurring, but long-term displacement would be unlikely unless habitats are greatly modified or disturbed, thus reducing potential forage. The primary consequences of ground-training exercises would be short-term displacement and some disturbance to animals within the immediate vicinity when training commenced; thus, the environmental consequences of ground training proposed under this alternative would be minimal for the moose populations in the training areas. Based on the wildlife significance criteria (Table 4.6.a), ground-training exercises would have a less-than-significant impacts on moose because disturbance and displacement were temporary and unlikely to result in changes in population habitat use or productivity.

Caribou

Caribou are relatively sensitive to low-level overflights and to close approaches by helicopters, particularly during the calving and post-calving seasons (McCourt et al., 1974; Calef et al., 1976; Miller and Gunn, 1979; Gunn and Miller, 1980; Gunn et al., 1983 and 1985). The calving/post-calving and rutting seasons are the periods when caribou are most sensitive to disturbance. Caribou are unlikely to occur in large numbers in the TFTA and YTA, except on those rare occasions when caribou move through the YTA in winter. Within the DTA, the primary areas where caribou would be affected by the increases in helicopter operations would be in the foothills of the Alaska Range. Overall, the population-level effects on caribou would be minimal for the helicopter operations proposed for Alternative 2, and the impacts would be considered less than significant.

Ground-training exercises, including munitions use, gunnery exercise, and ground vehicles and troops would occur primarily in established training areas and DZs where past disturbances have occurred and where habitats have been modified to some extent by previous exercises. Caribou are most likely to be in those areas during winter when they move to lower elevations in the DTA. Animals are likely to move out of areas experiencing increased training activity while those activities are occurring, but long-term displacement would not likely occur unless habitats are greatly modified and reducing potential foraging areas for caribou. The presence of helicopters and the noise and human disturbance (vehicles and people on the ground) associated with ground training would be greater disturbances to caribou. Other than short-term displacement and some disturbance to animals within the immediate vicinity of training exercises, the environmental consequences of ground training proposed under this alternative would be minimal for the caribou population in the DTA and the impacts would be less than significant.

Bison

The Delta bison herd is apparently well habituated to civilian and military aircraft in its range (Fancy, 1982). The limited increases in helicopter operations in the DTA would be likely to have minimal effects on bison using the area, other than possibly short-term displacement from DZs used during training exercises. Training exercises that occur in DZs within the calving range, such as the Sally DZ, during the early part of the calving season

could result in displacement and put newborn calves at risk of being trampled by other bison. Agreements between Alaska Department of Fish and Game (ADF&G) and the USAG Alaska are currently in place to reduce potential disturbance of the bison herd at the DTA (see Subsection 3.6.1.2 for descriptions of special management areas for bison in DTA). The Army will continue to 1) minimize disturbance to bison calving areas on DTA from April 15 through May 31, if bison are present, and 2) minimize disturbance to bison pre-migration areas from July 1 through August 31, if bison are present. The Army also does not conduct ground-training activities or operations within 2,000 meters of any bison during any time of year to minimize the impacts on bison (USAG-AK, 2007a). The impacts to bison from training would be less than significant because the mitigation measures would effectively limit disturbance and/or displacement of bison from important habitats; thus, long-term changes in population use of habitats or adverse impacts on reproduction or productivity are unlikely.

Dall Sheep

Small numbers of Dall sheep occur in the DTA. These Dall sheep would be affected primarily by any increases in the number of helicopter flights in the training area that occurred near sheep habitats. Dall sheep are sensitive to helicopter overflights, particularly at low altitudes (less than 200–500 feet) or in close proximity (Frid, 1999, 2001, and 2003; Lawler et al., 2004). Overall, the impacts to Dall sheep from training activities would be less than significant because any disturbance or displacement of sheep would be limited in duration and would not result in long-term changes in population use of habitats or adversely affect productivity or survival.

Brown and Black Bears

Brown bears are most likely to be exposed to training activities within the YTA and DTA, because few occur in the low-level habitats of the TFTA. Within the YTA, bears within forested habitats are likely to be less disturbed by low-flying or hovering helicopters because of the vegetative cover, which reduces both noise and visual disturbance. Bears in open meadows or at higher elevations above treeline in the DTA are more vulnerable to disturbance by helicopters and associated training. Most information on responses of brown bears to helicopter overflights is anecdotal, but one study on Alaska's North Slope found that brown bears ran most often in response to helicopters, often up to 1 mile before the aircraft arrived overhead, which indicated that helicopter noise was a strong stimulus (Quimby, 1974). He also found that five of 10 bears abandoned dens that were hovered over by a helicopter or overflown by a helicopter. Although few brown bears are likely to occur within the training areas, they are likely to show relatively strong responses to helicopters and other training activities when present.

Black bears are likely to occur in both the YTA and TFTA and to a somewhat lesser extent in the DTA. Black bears avoided the active military firing ranges in North Carolina, probably because of lack of suitable habitats (vegetation) within the range and human activity (camps, Soldiers on foot, vehicles) (Telesco and Van Manen, 2006). Some habituation of bears to disturbance was apparent in that study because bears were only 238 meters farther from high-disturbance noise zones during firing than during periods of no weapon firing. Although little is known about the reactions of denning black bears to low-level helicopter overflights or hovering, the potential for den abandonment could be high, particularly on the TFTA where black bear dens are known to den.

Although individual responses of bears to training activities could be moderate to severe, the overall effects on the bear population in the project area would still be only minimal to minor under Alternative 2; thus, the overall impacts of training on bears would be less than significant.

Migratory Waterbirds

Migratory waterbirds would be exposed to training exercises during spring and fall when moving through the training areas, and effects would be similar to those described previously for the flight corridors. Training activities also could affect breeding waterbirds during summer in both the TFTA and DTA; the YTA has few habitats that would support breeding waterbirds. Trumpeter swans nest within the TFTA and DTA and have been shown to be sensitive to aircraft disturbance elsewhere in Alaska. Henson and Grant (1991) conducted a study on the Copper River Delta, where they found that nesting swans reacted to 19 of 21 overflights (four commercial airliners, 10 smaller fixed-wing aircraft, five helicopters). The typical response for both males and females was a short-duration "head-up" posture and birds appeared to react first to the sound of the aircraft then went into alert posture when the aircraft was visible. No differences were observed between reactions to helicopters and fixed-wing aircraft. Responses of nesting trumpeter swans to helicopters flying low or hovering near nests are likely to be stronger, as those described in the previous study were for aircraft at moderate altitudes (<2,000 feet AGL). Severe disturbance or abandonment of nests would be likely if the disturbance event was prolonged or occurred repeated over a short time period. In addition to swans, other waterbirds nesting in the training areas could be disturbed by training exercises and, if the disturbance resulted in flushing of birds from nests or circling behavior (for example by gulls disturbed at nesting colonies), the potential for bird collisions with low-flying helicopters could increase. Overall, the environmental consequences of training on migratory waterbirds would be minimal to minor for most species, but could increase to minor to moderate for trumpeter swans. In general, the overall impacts of training on migratory waterbirds would be less than significant because of the short duration and temporary nature of the disturbance or displacement. For breeding trumpeter swans, however, the impacts would rise to a significant level if disturbance was wide-spread and prolonged during the breeding season and resulted in significant decreases in productivity (for example, through nest abandonment or brood loss).

Raptors

Effects of helicopter overflights on raptors in the training areas are similar to those described previously for the flight corridors, however, the low flight altitudes and hovering of helicopters in training areas has the potential to increase disturbance of nesting raptors, such as bald eagles, in particular. In the DTA, training exercises have to potential to disturb known golden eagle nests in the Donnelly Dome area and possible nesting areas in the upper elevations near the Alaska Range. The *National Bald Eagle Management Guidelines* (USFWS, 2007) outlines suitable buffer zones around active eagle nests (including golden eagles) to reduce chances of disturbance. These buffer zones include a 660-foot buffer from most noisy ground activities near nests, a 0.5–1 mile buffer for explosions or intermittent loud noises, and a 1,000-foot separation between aircraft and nests. The greatest potential for disturbance of nesting bald eagles is along the Tanana and Delta rivers in the TFTA and DTA, respectively. Avoidance of the riparian forest adjacent to the rivers during the nesting season would greatly reduce the potential for disturbance to nesting bald eagles. Craig and

Craig (1984) studied the reactions of raptors to a small survey helicopter and observed no reactions by golden eagles perched near nests to the visual or noise disturbance during six helicopter passes. They also observed red-tailed hawks, which showed a wider variety of reactions (circling/calling, perching, and sitting tight on nest). Overall, the impacts to bald eagles from training would be less than significant, particularly with the implementation of several mitigation measures (described previously under Flight Corridors).

Only a few peregrine falcon nest sites are known to occur in the DTA or YTA and, as described above for the flight corridors, peregrine falcons are relatively tolerant to helicopters overflights. Unless training exercises occur regularly around known peregrine nests, the effects on this sensitive species are likely to be minimal and less than significant for the training proposed under Alternative 2.

Ground-training exercises that include munitions firing may cause some disturbance to nesting bald eagles. As mentioned above, a 0.5- to 1-mile buffer zone is suggested to reduce disturbance of nesting eagles (USFWS, 2007). Brown et al. (1999) studied the effects of weapons-testing noise on bald eagles in Maryland and found that eagles had habituated to weapons-testing noise levels in excess of 120 dB (normal thunder is in the 82–103 dB range). They also found that bald eagle nest success and productivity were not affected, suggesting that weapons-testing noise did not influence eagle reproduction at the population level. Thus, the overall level of impacts on bald eagles would be less than significant.

Sandhill Cranes

The environmental consequences to migrating sandhill cranes were discussed in the flight corridors section and are similar for cranes flying through the training areas. Low-flying helicopters have the potential to fly under flocks of cranes or to flush resting cranes from roost sites in the DTA, which could present a major bird-aircraft collision hazard. Roosting sites used by migrating cranes in spring and fall could be avoided by scheduling training exercises after migration has finished or by avoiding the known roosting sites. Because only small numbers of sandhill cranes nest in the training areas, the likelihood of detrimental effects on this species during summer is minimal. Overall, the impacts of training on sandhill cranes would be less than significant as population-level changes are unlikely due to disturbance or displacement of migrating or roosting cranes.

Neotropical Migratory Birds and Other Sensitive Bird Species

Neotropical migrants are unlikely to be affected by the increased helicopters within the training areas associated with Alternative 2. Several species of concern (blackpoll warbler, olive-sided flycatcher, western wood-peewee, red-winged blackbird, rusty blackbird) do breed in the training areas, but their habitats are relatively common within the general region, such that short-term displacement or minor loss of habitat from training would have minimal effects on their populations. Other species of concern, such as sharp-tailed grouse, which have unique habitat requirements, are more vulnerable to the effects of training exercises. Sharp-tailed grouse use a traditional area for breeding (a lek) and these areas are known to occur in several of the DZs in the DTA. Avoidance of the leks during the short-breeding season (May) and avoiding habitat changes in those areas would reduce potential for adverse effects for this species. Overall, the environmental consequences of Alternative 2 would be minimal to minor for these bird populations and impacts would be less than significant based on the significance criteria (Table 4.6.a) of disturbance, displacement, and mortality.

4.6.2.3 Alternative 3: Combat Aviation Brigade

4.6.2.3.1 Aviation Personnel

For Alternative 3, the impacts to wildlife that would be attributable to the increase in aviation personnel would be similar to those for Alternative 2. However, because the number of Soldiers (and associated dependents and civilian personnel) would increase under Alternative 3 (compared with Alternative 2), the increase in recreational activities would be likely to increase compared to Alternative 2. Current State hunting regulations and permit requirements would likely mitigate this impact on large mammals, such as moose, caribou, Dall sheep, and mountain goat; thus, the overall impacts of increases in aviation personnel on wildlife would be less than significant

4.6.2.3.2 Aviation Assets

For this alternative, the effects of increases in aviation assets would occur at FWA, FRA, and Eielson AFB. Similar to Alternative 2, these increases in helicopter numbers would result in minimal impacts to most wildlife, other than through loss of habitat required by the construction of additional facilities (see Subsection 4.6.2.3.3). Most of the effects on wildlife of increased numbers of helicopters would occur during the military training operations (see Subsection 4.6.2.3.4) and less so from normal maintenance and housing of equipment. Some short-term increases in disturbance (noise and visual) to birds near the airfields and hangars would occur during ground operations of the helicopters (engine tests) and short-distance flights at the airfield during flight proficiency training. Increases in the number of generators and ground vehicles would increase noise levels somewhat, but as these are located within the Cantonment, the increases would likely have minimal effects on wildlife populations; thus, impacts would be less than significant was disturbance and/or displacement would be temporary and not result in long-term population changes.

4.6.2.3.3 Facilities Construction and Demolition

Under Alternative 3, the increased number of aviation assets and supporting personnel would result in the construction or renovation of a number of new facilities to support the newly formed Brigade. Impacts on wildlife would be similar to those for Alternative 2. Similarly, then the overall impacts on wildlife from these activities would be less than significant.

4.6.2.3.4 Military Training

Airfields

Disturbance to wildlife associated with helicopter training exercises at the FWA, Eielson AFB, and FRA airfields would likely be minimal, as those areas already experience high levels of human use and have a well-developed infrastructure and, therefore, support minimal wildlife populations. A few moose that might be resident within the Post boundaries could experience low-levels of disturbance from noise and overflights at the airfields, but they likely are already habituated to high-levels of human disturbance. Based on the significance criteria requirements for long-term changes in populations habitat use, productivity, or mortality, the increased uses of airfields would have less-than-significant impacts on wildlife.

Flight Corridors (FWA-TFTA/YTA, Eielson AFB-DTA, FWA-DTA, FRA-DTA)

Large Mammals

The environmental consequences of Alternative 3 are similar to those for Alternative 2 for many of the selected species, particularly those found primarily in the FWA, TFTA, YTA, and DTA areas. Some disturbance effects (primarily noise) would be minimized by the required flight altitudes (greater than 500 feet AGL). However, the increased numbers of helicopters in transit along the flight corridors would increase the duration of exposure of large mammals (caribou, moose, and Dall sheep) in the area to helicopter noise and visual disturbance. Increases in helicopter operations within the flight corridors would have the greatest impacts on moose, resulting in temporary disturbance and displacement from habitats. The overall impacts of increased helicopter activity associated with Alternative 3 would be minor for caribou, minimal (FWA-DTA) to minor (FWA-TFTA and FRA-DTA flight corridors) for moose, minimal for bison, and minimal to minor for Dall sheep.

Caribou

The effects of helicopter flights in the flight corridors from FWA to TFTA, YTA, and DTA are similar to those for Alternative 2, and the flight corridor between Eielson AFB and DTA would have minimal effects on caribou given its location relative to caribou use of the area. Along the flight corridor between FRA-DTA, the once-yearly helicopter overflights would cause some disturbance (most likely alert behaviors and perhaps displacement if directly overflown) to any caribou occurring within the flight corridor. This disturbance response would be likely to occur along the Richardson Highway where Nelchina herd caribou can occur and often cross the highway. The location of the flight corridor along the Richardson Highway and the flight altitudes used by helicopters in transit (500-foot minimum AGL) would reduce the potential for noise disturbance to caribou. However, some startle responses of individuals might occur under some conditions. Overall, the effects on caribou of helicopter flights within the corridors proposed for Alternative 3 would be minimal and impacts would be considered less than significant.

Dall Sheep

Dall sheep would not be affected by the helicopter flights between FWA and the training areas or by the Eielson AFB-DTA flight corridor. Disturbance of Dall sheep could occur along the flight corridor between FRA and DTA where this corridor passes over Dall sheep habitats in the Alaska Range, particularly north of Isabel Pass. Sensitivity of Dall sheep to helicopter overflights was discussed in Subsection 4.6.2.2.4. The helicopter altitude limitations in the flight corridor should mitigate much of the possible impacts (behavioral disturbance or displacement), as well as the restriction of helicopters to the airspace directly above the Richardson Highway, thus further avoiding Dall sheep habitats. Overall, helicopter flights within the flight corridors would have less-than-significant impacts on Dall sheep.

Brown and Black Bears

The increases in helicopter numbers within the flight corridors under Alternative 3 would probably not measurably change the magnitude of the environmental effects on bears. A few more black bears may be disturbed within the new Eielson AFB-DTA flight corridor, but not enough to result in a population-level impact. Reactions of bears to helicopter overflights were discussed in Subsection 4.6.2.2.4. Bears are widely scattered along the FRA-DTA flight corridor, which would limit the potential for exposure of many bears to

disturbance during this once a year event. Overall, the effects on brown and black bears from helicopter movements within the flight corridors proposed for Alternative 3 would be similar or slightly greater than for Alternative 2, but would be unlikely to exceed a minimal to minor level; therefore, the impacts would be less than significant.

Birds

The primary effects of movements along the flight corridors for Alternative 3 would be on waterbirds and sandhill cranes, which are most numerous during spring and fall migration. At those times, the potential for disturbance and bird-aircraft collisions would increase when larger number of helicopters would be operating in the FWA-DTA and Eielson AFB-DTA flight corridors. Unless the use of the flight corridor between FRA-DTA occurs during a major migratory period for birds, the effects of that corridor is likely to be minimal, because of the flight altitude along the corridor and because the corridor is over the existing highway system where few birds are likely to be nesting. The addition of helicopters at Eielson AFB would increase the number of helicopters flying along the Tanana and Delta rivers to reach the training areas in the DTA.

Raptors

The addition of helicopters at Eielson AFB under Alternative 3 would increase the number of helicopters flying along the Tanana and Delta rivers to the DTA, which would be near the known nest sites of peregrine falcons in that area and to bald eagles nesting along the Tanana and Salcha rivers. Similarly, the increase in helicopters moving along the Tanana River within the FWA-YTA, FWA-TFTA, and FWA-DTA flight corridors would increase the likelihood of disturbance to bald eagles nesting along the river. The FRA-DTA flight corridor passes over suitable habitats for many raptors species including bald and golden eagles, peregrine falcons, and other nesting hawks. The limited nature of use of that route, the small number of helicopters, and the location of the corridor over the highway system would limit likelihood of effects of that corridor on raptors. The mitigation measures outlined previously for raptors (particularly bald eagles) would also be in effect under this alternative (see Subsection 4.6.3). Overall, the environmental consequences of Alternative 3 are similar or slightly greater than those of Alternative 2, and are minimal to minor for raptors. The impacts to raptors of use of the flight corridors would be less than significant for most raptors, particularly if the mitigation measure reduce potential disturbance of nesting bald eagles (as described previously for Alternative 2).

Sandhill Cranes

The addition of helicopters at Eielson AFB under Alternative 3 would increase the number of helicopters flying along the Tanana and Delta rivers to reach the training areas in the DTA. As described for Alternative 2, sandhill cranes using roosting areas on the Delta River and in the DTA are sensitive to disturbance by helicopters. Sandhill cranes are only likely to encounter military aircraft using the flight corridor between FRA and DTA, if this event occurs during the peak periods of crane migration (mid-April to early May, early to mid September). Of particular concern along the FRA-DTA flight corridor is the Isabel Pass to DTA segment because it transects the primary migration route used by large numbers of cranes that fly along the northern foothills of the Alaska Range. This area also would be the location with the greatest probability of interactions between helicopters and large flocks (up to 1,000 birds) of migrating cranes. The current schedule for the proposed flight exercise between FRA and DTA (March-April) would reduce the potential for encounters between

migrating cranes and helicopters traversing the corridor if the exercise was scheduled before mid-April. Overall, the impacts of Alternative 3 at the population level are minimal to minor for sandhill cranes, and the overall impacts would be less than significant based on the temporary nature of any disturbance or displacement of migrating or roosting cranes.

Migratory Waterbirds

Effects of increased helicopter traffic in the FWA flight corridors would result in some increased potential for disturbance of migrating waterbirds and breeding waterbirds within the flight corridors. The Eielson AFB-DTA flight corridor would have minimal additional increases in disturbance to waterbirds. The flight corridor between FRA and DTA passes along the Glenn Highway in an area where migrating waterbirds, including trumpeter swans, would be encountered during spring and fall migration. Other migratory waterbirds use the same migration route at the northern end of the FRA-DTA corridor near Delta. As mentioned for Alternative 2, many migratory waterbirds fly westward along the Tanana River and over the Tanana Flats, which brings them across the helicopter flight corridor between FWA-TFTA and the FWA-DTA corridor, as well as the flight corridors between the TFTA and YTA, and the flight corridors between Eielson AFB and TFTA/DTA. Because the timing of waterfowl migration in spring and fall is relatively predictable, helicopter flights could avoid peak migration periods by proper scheduling of training activities. Overall, the increases in helicopter operations as proposed for Alternative 3 would have minimal impacts on migratory waterbirds given the limited timing when large numbers of birds would be in the flight corridors; thus, the overall impacts would be less than significant.

Neotropical Migratory Birds and Other Sensitive Species

Neotropical migrants are unlikely to be affected by the increased helicopter operations along the flight corridors between FWA and the training areas, or by the FRA-DTA flight corridor associated with Alternative 3. These species, which are well dispersed in the training areas and along the flight corridors, are unlikely to have population-level impacts from intermittent disturbance associated with the helicopter overflights. Based on the significance criteria in Table 4.6.a, the overall impacts of helicopter use of the flight corridors on these species would be less than significant.

Training Areas and Facilities

This section focuses primarily on the effects of increased levels of all activities associated with Alternative 3. In the discussion of environmental consequences of Alternative 2, the types of reactions that wildlife species may exhibit when exposed to helicopters and training exercises were described in detail and would not be repeated below.

Large Mammals

Responses of large mammals to helicopter overflights and noise were summarized for Alternative 2 (Subsection 4.6.2.2.4). This section would focus on responses of large mammals to the increased use of training facilities associated with the larger numbers of helicopters proposed for this alternative. Increases in helicopter operations at DTA and in the DZs would increase the potential for disturbance of large mammals, primarily bison and moose, in those areas.

Moose

Moose in the TFTA, YTA, and DTA would experience increases in the levels of disturbance from increased helicopter training and ground exercises. Greatest potential for increases in

detrimental impacts would be during the calving season, particularly in the TFTA. Increases in helicopter flights also could impede moose movements to and from the TFTA during spring and fall, which could affect the portion of the moose population that winters in the Chena River Hills but migrates to TFTA in the summer. Monitoring of moose populations over the last few years (during temporary stationing of ATF) has indicated no change from previous herd health, reproduction, or movement. During munitions training, USARAK regulations require that firing activities to cease immediately upon the discovery of cow and calf pairs down range, which would mitigate effects of that type of activity on moose. Within the training area at FRA, where increased overflights are also projected to occur, some temporary displacement of moose from the training area would be likely to occur for the duration of each training exercise. The detrimental impacts of this displacement would be mitigated to some extent because a large area within the boundaries of FRA and nearby Elmendorf AFB are relatively unaffected by disturbance and these undisturbed habitats occur in a major metropolitan area where large expanses of suitable habitat are lacking. The Army will continue to implement AR 350-2, which includes guidelines for the avoidance of harassment of wildlife. Additional observations will be incorporated into ongoing monitoring to determine whether heard health, reproduction, or movement have changed as a result of helicopter training. A moose migration study will be conducted on TFTA. Overall, the impacts to moose for Alternative 3 would be minor to moderate and the level of impacts would be less than significant because most displacement or disturbance would be temporary and population-level impacts on this important game species are unlikely to occur.

Caribou

Caribou may also experience increased levels of disturbance during training exercises in the DTA, particularly if helicopter operations are extended into the high-elevation habitats (for example, Molybdenum Ridge area) where this species is more common. Impacts to caribou would stay in the minimal to minor range for Alternative 3 and overall impacts would be considered less than significant.

Dall Sheep

In the FRA, the effects of increased helicopter operations would not affect most Dall sheep, as their primary habitats are not located near the Eagle River range. However, some disturbance could occur if helicopters were to operate in the alpine areas of FRA, where sheep are more likely to occur. Dall sheep may also experience increased levels of disturbance during training exercises in the DTA particularly if helicopter operations are extended into the high-elevation habitats (for example, Molybdenum Ridge area) where these species are more common. Overall, however, the impacts of training on Dall sheep are less than significant because disturbance and displacement would be temporary and of short duration, and none of the proposed activities are likely to result in a population-level change in habitat use, productivity, or mortality.

Brown and Black Bears

Effects of increased helicopter overflights on denning brown bears at FRA are uncertain. The FRA area is probably one of the primary routes of brown bears from their dens in the Chugach Mountains to the salmon streams along the Cook Inlet coast. Increased helicopter activity within the FRA Post and training area could result in more disturbance to these bears. As described in Subsection 4.6.2.2.4, brown bears have been known to abandon dens

if disturbed; thus, to limit the impacts of low-level helicopter flights on denning brown bears at FRA, more information on den locations would be required to move training activities away from active dens. Black bears also occur in the FRA but are not likely to be as susceptible to disturbance at dens; however, they may be affected by increased activities in the training areas under Alternative 3. Effects of training on bears in the TFTA, YTA, and DTA are likely to be similar to those described for Alternative 2. Overall effects on the bear populations in the project area would still be only minimal to minor under Alternative 3, and impacts would be considered less than significant.

Beluga Whales

Increases in helicopter operations at FRA would increase the potential for disturbance to any beluga whales that might occur within the Eagle River or in the near-shore waters off the ERF. Current plans for Alternative 3 do not include door gunnery training on ERF. If Alternative 3 were selected, then consultation with the USFWS and National Marine Fisheries Service (NMFS) would be undertaken as required under Section 7 of the Endangered Species Act to identify issues associated with beluga whales. Thus, the relative magnitude of impacts on beluga whales would be minimal and are less than significant.

Birds

As mentioned for the flight corridors, the primary seasons when helicopter overflights would have the greatest potential for adverse effects in the training areas would be during spring and fall migration when large numbers of birds are traversing the training areas, particularly the DTA, TFTA, and YTA; less adverse effects would occur in the FRA because that area is not within a major migratory corridor. At those times, the potential for disturbance and bird-aircraft collisions would increase when larger number of helicopters would be operating in the DTA and TFTA, in particular.

Raptors

The addition of helicopters at Eielson AFB under Alternative 3 would increase the number of helicopters flying in the training areas. The increased disturbance would be unlikely to have major effects on raptors. Overall, the environmental consequences of Alternative 3 are similar or slightly greater than those of Alternative 2, and are minimal to minor for raptors. As mentioned for the flight corridors discussion above, adherence to the buffer zones outlined in the *National Bald Eagle Management Guidelines* (USFWS, 2007) and implementation of the proposed mitigation measures would decrease the impacts on the bald eagle, particularly avoidance of nesting areas during low-level overflights within the training areas. Overall, the impacts to raptors from training would be less than significant.

Sandhill Cranes

As described for Alternative 2, sandhill cranes using roosting areas on the Delta River and in the DTA are sensitive to disturbance by helicopters. The addition of the noisier Apache helicopters at Eielson AFB would possibly have more impact on roosting cranes, if their training activities required their overflying the known roosting areas in the DTA. Sandhill cranes do use the ERF Training Area during migration, as well, but are only there for a short period and are unlikely to be affected by the training exercises on FRA. Overall, however, the impacts of Alternative 3 at the population level are minimal to minor for sandhill cranes and would be considered less than significant.

Migratory Waterbirds

Effects of increased helicopter traffic in training areas would increase disturbance of migrating waterbirds and breeding waterbirds. In particular, increases in training in the TFTA and DTA would potentially disturb more nesting trumpeter swans and other waterbirds. Migratory waterbirds and a few nesting trumpeter swans also occur within the FRA and could be affected by increased use of the ERF. Overall, for the training proposed under Alternative 3, the environmental consequences on migratory waterbirds would be minimal to minor for most species, but could increase to minor to moderate for trumpeter swans. In summary, the overall impacts of training on migratory waterbirds would be less than significant because of the short duration and temporary nature of the disturbance or displacement. For breeding trumpeter swans, however, the impacts would rise to a significant level if disturbance was wide-spread and prolonged during the breeding season and resulted in significant decreases in productivity (for example, through nest abandonment or brood loss).

Neotropical Migratory Birds and Other Sensitive Species

Neotropical migrants are unlikely to be affected by the increased helicopter operations in the training areas associated with Alternative 3. Most of the species are well dispersed in the training areas and are unlikely to have population-level impacts from intermittent disturbance associated with the helicopter overflights. As described for Alternative 2, several species of concern (blackpoll warbler, olive-sided flycatcher, western wood-peewee, red-winged blackbird, rusty blackbird) do breed in the training areas and any short-term displacement or minor loss of habitat from training would have minimal effects on their populations. In the DTA, increases in training exercises associated with Alternative 3 could adversely affect use of breeding leks by sharp-tailed grouse in some of the DZs. Overall, the environmental consequences of Alternative 2 would be minimal to minor for most of these bird populations, but effects on sharp-tailed grouse could increase to moderate if leks are not avoided during ground exercises. Impacts of training on these species would remain less than significant for Alternative 3.

4.6.2.4 Summary of Impacts

Table 4.6.b summarizes the overall effects of the alternatives on wildlife populations. Table 4.6.c presents a comparative summary of how the alternatives relate to the significance criteria presented in Table 4.6.a. Alternatives 2 and 3 do present potentially significant impacts compared to the No Action alternative. The implementation of some mitigation (presented in Subsection 4.6.3.2) may help reduce impacts on some species.

TABLE 4.6.b
Comparative Summary of Impacts by Alternative for Wildlife
USARAK Aviation EIS

Species	Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Caribou	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal to minor impacts, some disturbance and displacement possible for Nelchina caribou near corridor.	Minor impacts, disturbance and displacement greater, primarily for Nelchina caribou near corridor.

TABLE 4.6.b
Comparative Summary of Impacts by Alternative for Wildlife
USARAK Aviation EIS

Species	Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
	Training Areas and Facilities	Current levels of disturbance.	Minimal to minor impacts, some disturbance and displacement possible at DTA.	See Alternative 2.
Moose	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal impacts, some disturbance of a few individuals along the flight corridor.	Minimal impacts, some disturbance of a few individuals along the flight corridor.
	Training Areas and Facilities	Current levels of disturbance.	Minimal at DTA, minimal to minor at FRA, where helicopters and noise increase potential for disturbance and temporary displacement.	Minimal at DTA, minor at FRA, where additional helicopter operations increase disturbance and displacement.
Bison	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	None to minimal impacts, a few individuals may be disturbed.	None to minimal impacts, a few individuals may be disturbed.
	Training Areas and Facilities	Current levels of disturbance.	Minimal impacts, some disturbance of a few individuals.	Minimal impacts, some disturbance of a few individuals.
Dall Sheep	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal impacts, a few individuals along the corridor may be disturbed.	Minimal to minor impacts, increased number of daily helicopter flights may increase overall impacts (noise, visual disturbance) for sheep along the corridor.
	Training Areas and Facilities	Current levels of disturbance.	None to minimal impacts, a few individuals may be disturbed.	None to minimal impacts, a few individuals may be disturbed.
Brown and Black Bears	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal impacts, a few individuals along the corridor may be disturbed.	Minimal impacts, a few individuals along the corridor may be disturbed.
	Training Areas and Facilities	Current levels of disturbance.	Minimal to minor impacts, a few individuals may be disturbed; possibly some den disturbance.	Minimal to minor impacts, a few individuals may be disturbed; possibly some den disturbance.
Beluga Whale	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	No impacts.	No impacts.	No impacts.

TABLE 4.6.b
Comparative Summary of Impacts by Alternative for Wildlife
USARAK Aviation EIS

Species	Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
	Training Areas and Facilities	Current levels of disturbance.	Minimal impacts as no training is planned for the Eagle River flats area or in near-shore waters of Cook Inlet at FRA.	Minimal impacts as no training is planned for the Eagle River flats area or in near-shore waters of Cook Inlet at FRA.
Migratory Waterbirds	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal impacts, disturbance of migrating birds along Glenn Highway and near DTA and FWA-DTA-Eielson AFB corridor; some potential for bird-aircraft collisions during migration.	Minimal impacts, disturbance of migrating birds along Glenn Highway and near DTA and FWA-DTA-Eielson AFB corridor; greater potential for bird-aircraft collisions during migration.
	Training Areas and Facilities	Current levels of disturbance.	Minimal impacts, disturbance of migrating waterfowl at DTA and Tanana Flats; some potential for bird-aircraft collisions during migration.	Minimal impacts, disturbance of migrating waterfowl at DTA; greater potential for bird-aircraft collisions during migration.
Raptors	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal to minor impacts, for peregrine falcons and other raptors, minor to moderate for nesting bald eagles; disturbance of nesting bald eagles in the FWA-TFTA and FWA-DTA corridors near the Tanana and Delta rivers; some potential for bird-aircraft collisions during migration.	Minimal to minor impacts, for peregrine falcons and other raptors, minor to moderate for nesting bald eagles; disturbance of nesting bald eagles in the FWA-TFTA, FWA-DTA, and Eielson AFB-DTA corridors near the Tanana and Delta rivers, some potential for bald eagle nest disturbance at FRA and along the FRA-DTA flight corridor; some potential for bird-aircraft collisions during migration.
	Training Areas and Facilities	Current levels of disturbance.	Minimal to minor impacts, for peregrine falcons and other raptors, minor to moderate for nesting bald eagles; disturbance of nesting bald eagles at TFTA and DTA near the Tanana and Delta rivers; some potential for bird-aircraft collisions during migration.	Minimal to minor impacts, for peregrine falcons and other raptors, minor to moderate for nesting bald eagles; disturbance of nesting bald eagles in the TFTA, DTA, and FRA; some potential for bird-aircraft collisions during migration.
Sandhill Crane	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	Minimal to minor impacts, disturbance of migrating cranes near Alaska Range; displacement from roosting sites at DTA; some potential for bird-aircraft collisions during migration.	Minor impacts during migration when potential disturbance of migrating cranes near Alaska Range greatly increases with more helicopters; displacement from roosting sites at DTA; greater potential for bird-aircraft collisions during migration.

TABLE 4.6.b
Comparative Summary of Impacts by Alternative for Wildlife
USARAK Aviation EIS

Species	Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
	Training Areas and Facilities	Current levels of disturbance.	Minimal to minor impacts, disturbance or displacement from roosting sites at DTA; some potential for bird-aircraft collisions during migration.	Minimal to minor impacts, disturbance or displacement from roosting sites; potential for bird-aircraft collisions increases with more helicopters in DTA.
Neotropical Migratory Birds and other sensitive birds	Facilities/ Operations/ Maintenance	No impacts.	No impacts.	No impacts.
	Flight Corridors	Current levels of disturbance.	None to minimal impacts, some disturbance of breeding birds; some potential for bird-aircraft collisions during migration.	None to minimal impacts, some disturbance of breeding birds; some potential for bird-aircraft collisions during migration.
	Training Areas and Facilities	Current levels of disturbance.	None to minimal impacts, some disturbance of breeding birds; some potential for bird-aircraft collisions during migration.	None to minimal impacts, some disturbance of breeding birds; some potential for bird-aircraft collisions during migration; possible moderate impacts to sharp-tailed grouse if breeding leks are affected.

TABLE 4.6.c
Comparison of Alternative by Significance Criteria
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Disturbance	Current levels of disturbance.	Some disturbance to large mammals during training activities in training areas and flight corridors. Potential bird collisions during flights; however, these effects should be minimal at the population level. Some disturbance may occur to breeding birds.	Impacts would be similar to Alternative 2.
Displacement	No impacts.	Potential temporary displacement of caribou and moose. Possible displacement of sandhill cranes from roosting sites at DTA.	Impacts would be similar to Alternative 2.
Mortality	Current levels of mortality.	Potential for bird collisions with helicopters during migration; however, these effects should be minimal at the population level. Some disturbance may occur to breeding birds.	Impacts would be similar to Alternative 2.

4.6.3 Mitigation

Impacts to wildlife populations will range mostly from none to minimal, with only a few impacts rising to the level of moderate. The measures of significance for these impacts were disturbance, displacement, and mortality that resulted in long-term or permanent changes to populations (Table 4.6.a). The analysis of project alternatives on wildlife populations found that, although some individual animals will experience adverse effects, impacts at the population level were less than significant. Mitigation measures will be implemented to reduce the potential for very low impacts to occur. The Army will implement the following mitigation measures:

- Additional monitoring to evaluate whether moose herd health, reproduction, or movement are changing as a result of helicopter use.
- USARAK will work with ADF&G to conduct a moose migration study in the TFTA to evaluate migration patterns and moose production to monitor the health of the herd.
- Pilots will be made aware of sandhill crane roosts along the Delta River and in the DTA during spring and fall migration, and advised to alter travel paths during these times. This advisory will reduce the potential for disturbance of those areas.
- The Army will work with the USFWS to increase monitoring frequency of trumpeter swans in the Tanana Flats from every 5 years to annually to detect impacts from increased training. Annual monitoring will evaluate whether increased training affects the breeding success of trumpeter swans in the Tanana Flats, including TFTA and DTA West.
- Develop a wildlife awareness program for pilots and Soldiers in concert with Range Control, Natural Resources, and the unit that describes sensitive wildlife species present on Posts, along flight corridors, and in training areas; identifies sensitive wildlife areas; describes types of wildlife behaviors that indicate disturbance; describes seasonal time periods when wildlife may be more vulnerable to disturbance (moose calving, bird nesting, or migration); and discusses procedures that will reduce potential for disturbance to wildlife and aircraft-bird collisions. The awareness program will incorporate the existing ArcGIS models used for range scheduling to depict wildlife areas and dates of use by sensitive species.
- Survey construction sites, based on USFWS criteria, to ensure construction and occupancy of facilities would not impact eagle nesting and feeding habits.
- Conduct surveys for raptor nests in the TFTA, YTA, and DTA, and along the flight corridors between FWA-TFTA and FRA-DTA to locate nesting bald eagles and other raptors that may be affected by helicopter overflights and training activities.
- Consult with the USFWS to determine best methods to reduce and/or prevent harassment of migratory birds and raptors during military helicopter training.
- Consult with the National Marine Fisheries Service about effects to the beluga whale under Alternative 3 only.

4.7 Air Quality

4.7.1 Significance Criteria

The significance criteria for air quality include increased pollution, contribution to current conditions, and interference with attainment of National Ambient Air Quality Standards (NAAQS) (see Table 4.7.a). Activities that do not exceed regulatory thresholds but result in measurable emission changes would be considered minor to moderate impacts. The regulatory de minimis thresholds for the pollutants referenced in Table 4.7.a are the basis of the significance criteria used to assess the potential impacts of the Proposed Action alternatives. These thresholds are specifically developed to ensure compliance with NAAQS.

Particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), nitrogen oxide (NO_x) sulfur dioxide (SO_2), and volatile organic compounds (VOCs) were chosen as key pollutants due to the Fairbanks $PM_{2.5}$ nonattainment designation. NO_x, SO_2, and VOCs are designated by EPA as precursors to $PM_{2.5}$ (40 CFR 51). In addition, carbon monoxide (CO) was chosen as a key pollutant because of Fairbanks and the Municipality of Anchorage air quality regions as CO maintenance areas. Table 4.7.k in Subsection 4.7.2.4 provides an analysis of the Proposed Action alternatives compared to the significance criteria.

TABLE 4.7.a
Air Quality Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Increase in air pollution above the NAAQS	CO, NO_x, SO_2, VOC, and $PM_{2.5}$ emissions greater than 100 tons per year (tpy) in Fairbanks' $PM_{2.5}$-designated nonattainment area and Fairbanks' CO maintenance area.
	Stationary source emissions greater than major permit modification thresholds for new sources at FWA.
	CO emission greater than 100 tpy in the Municipality of Anchorage CO maintenance area.
Contribute to an existing violation of the NAAQS	CO, NO_x, SO_2, VOC, and $PM_{2.5}$ emissions greater than 100 tpy in Fairbanks' $PM_{2.5}$-designated nonattainment area and Fairbanks' CO maintenance area.
	Stationary source emissions greater than major permit modification thresholds for new sources at FWA.
	CO emission greater than 100 tpy in the Municipality of Anchorage CO maintenance area.

4.7.2 Environmental Consequences for Air Quality

The EPA General Conformity Rule ensures that the actions taken by federal agencies in nonattainment and maintenance areas meet national standards for air quality. Established under the Clean Air Act (CAA), the General Conformity Rule plays an important role in helping states improve air quality in areas that do not meet the NAAQS. Under the General Conformity Rule, federal agencies must work with State and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the initiatives established in the SIP. The general conformity rule first involves a conformity analysis to determine if the Proposed Action is exempt. The quantity of the nonattainment or maintenance area pollutant and its precursors released during the highest emission year is compared with the thresholds. If a pollutant is above a threshold, the proposed facility requires a Determination. The analyses must consider construction year(s) as well as

operating years and include direct emissions and indirect emissions that would result from the Proposed Action. The applicability analysis is conducted on the worst-case scenario of potential emissions associated with the Proposed Action.

Alternative 3 (CAB) was used as the worst-case scenario to model probable increases in direct and indirect emissions in the defined air quality regions as a result of the Proposed Action. Alternative 3 has the most construction of new facilities, all on the FWA Main Cantonment, and increased assets (personnel and helicopters). Facility construction and operation may cause an increase in emissions from CO, $PM_{2.5}$, and its precursors into the Fairbanks area under both action alternatives. Although FRA is outside the maintenance area, increased personnel and helicopters stationed at FRA under Alternative 3 would potentially affect the bordering Municipality of Anchorage CO maintenance area. As a result, the general conformity rule for CO applies to both Fairbanks and Anchorage in order to demonstrate that the Proposed Action would conform to the SIP (40 CFR 51 and 18 Alaska Administrative Code (AAC) 50.725). The General Conformity Rule for $PM_{2.5}$ would also apply to the Fairbanks nonattainment area, even though the State's attainment-demonstration plan has not been added to the SIP. The general conformity threshold values for CO, $PM_{2.5}$, NO_x, SO_2, and VOCs are each 100 tpy.

The worst-case year related to the Proposed Action was determined to be a construction year with the first year of full operation (estimated at 2013) of Alternative 3. Combined direct and indirect source emissions of CO, $PM_{2.5}$, NO_x, SO_2, and VOC released into the Fairbanks CO maintenance area under Alternative 3 are shown below in Table 4.7.b. These amounts are below the 100-tpy threshold for each pollutant.

TABLE 4.7.b
Potential Emissions from Worst-Case Scenario in Tons per Year, Alternative 3
USARAK Aviation EIS

Location	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Construction 2013	20.3	17.6	0.32	5.4	2.1
Operation 2013	33.4	9.3	0.84	0.6	4.4
Total	**53.4**	**26.8**	**1.16**	**6.0**	**6.5**

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to particulate matter equal to or less than 10 microns in diameter (PM_{10}) emissions because accurate emission factors for $PM_{2.5}$ are limited.

Indirect emissions from FRA – emissions potentially affecting the MOA CO maintenance area – were estimated at 28.0 tpy under Alternative 3. This amount is below the CO threshold of 100 tpy. Therefore, the Proposed Action would not require further general conformity analyses. Supporting documentation is provided in the *General Conformity Technical Memorandum* presented in Appendix D.

Since general conformity has been established for the FWA cantonment area and effects to the MOA maintenance area, air quality impacts resulting from Alternatives 1, 2, and 3 are discussed and presented for each air quality region in the following sections.

4.7.2.1 Alternative 1: No Action

4.7.2.1.1 Aviation Personnel

Under the No Action alternative, numbers of aviation personnel and contract employees would remain the same at FWA, FRA, and Eielson AFB. Indirect emissions from commuting vehicles would remain at the current levels and have no significant impact on CO emissions in the CO maintenance areas for Anchorage or Fairbanks. Indirect emissions effects from commuting vehicles to the Fairbanks $PM_{2.5}$ nonattainment designation are undetermined. Future vehicle emission testing and federal fuel manufacturing requirements would help reduce the effects of vehicle emissions on $PM_{2.5}$. Wood-burning stoves, considered a major contributor to $PM_{2.5}$, are limited at FWA and would not interfere with the timely attainment of $PM_{2.5}$. There would also be no impact to the remaining NAAQS in Anchorage and the NAAQS in the remaining air quality regions.

4.7.2.1.2 Aviation Assets

The number of helicopters, vehicles, and generators would not change under the No Action alternative. There would be no impact on emissions in the air quality regions from the existing conditions.

4.7.2.1.3 Facilities Construction and Demolition

No new facilities would be constructed and no facilities demolished under the No Action alternative. Therefore, no emissions would be released as a result of construction or stationary source operations associated with building and operating new facilities. Current air quality operating permits and mitigation programs for existing stationary source emissions at FWA, FRA, and Eielson AFB prevent impacts to ambient air quality in each air quality region. In addition, the Central Heat and Power Plant (CHPP) boilers located on FWA are equipped with particulate filters on the exhaust stacks, which greatly reduce the potential impact of $PM_{2.5}$ emissions to the Fairbanks nonattainment area.

4.7.2.1.4 Military Training

The number and frequency of training exercises would remain close to current projected numbers under the No Action alternative. Emissions from helicopter operations under the No Action alternative would have negligible impact on ambient air quality in the Anchorage, FNSB, Interior training area, or flight corridor air regions.

4.7.2.2 Alternative 2: Aviation Task Force

4.7.2.2.1 Aviation Personnel

Under Alternative 2, the number of aviation personnel and contract employees would only increase at FWA. Aviation personnel and contract employee increases for Alternative 2 would be approximately half the increase seen at FWA in Alternative 3 (the worse-case scenario). Indirect emissions from commuting vehicles were calculated using EPA's Mobile 6 with the commuter assumptions listed in Appendix D for Alternative 3. The estimated emissions for Alternative 2 are shown in Table 4.7.c and were assumed to be half the emissions calculated by Mobile 6 for Alternative 3.

TABLE 4.7.c
Potential Indirect Emissions from Vehicles in Tons per Year, Alternative 2
USARAK Aviation EIS

Location	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	14.7	1.5	0.02	0.06	0.8

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.

Subsequently, increases in vehicle emissions at FWA caused by Alternative 2 would have minor to no significant impact to the overall air quality status of Fairbanks. Commuter emissions would not impact the ability of Fairbanks to achieve attainment status for $PM_{2.5}$ because the emissions levels of $PM_{2.5}$ and its precursor are a fraction of the significance threshold of 100 tpy and the increase in vehicles is minor compared to the current vehicle burden in the area.

4.7.2.2.2 Aviation Assets

Under Alternative 2, additional helicopter, vehicle, and generator assets would only be assigned to FWA to support the Task Force. Helicopters would be used for military training activities, and the air quality effects for increased helicopter activity for military training are addressed in Subsection 4.7.2.2.4.

Additional military vehicles and generators would be assigned to the Task Force as part of Alternative 2, and used to support the mission requirements for the Task Force. The generator sizes and the minimal hours of operation would cause emissions from these sources to have no significant impact to ambient air quality. In addition, portable generators that can be transported by hand are considered insignificant emission units [18 AAC 50.326(f)]. The military vehicle assets would also have little impact on the NAAQS for the Interior training, FNSB, and flight corridor air quality regions. The amount of vehicle assets in Alternative 2 is approximately one-quarter of the similar type of vehicle assets presented in the USARAK Transformation EIS, which was deemed no significant impact. In addition, the routine transport of material as well as personnel and the routine operation of mobile assets and equipment are considered de minimis activities in conformity analyses (40 CFR 51.853). Localized particulate matter events may be present in training exercises but would not contribute to a violation of the NAAQS.

4.7.2.2.3 Facilities Construction and Demolition

Construction, demolition, and operation of new facilities under Alternative 2 would only occur at FWA. The total footprint and number of new facilities are less than the planned construction for Alternative 3. Based on the analysis completed for Alternative 3 (the worst-case scenario), construction and demolition activities are not expected to adversely affect ambient air quality; additionally, the operation of new stationary sources under FWA or Doyon Utilities, LCC (DU) Title V operating conditions or new restrictions through permit-to-construct (PTC) requirements would prevent a violation of the NAAQS in Fairbanks. FWA and the CHPP (DU) are Prevention of Significant Deterioration (PSD) and Nonattainment Major Facilities and any installation of new stationary sources activities must undergo a PSD and nonattainment major modification determination (18 AAC 50.306,

18AAC 50.311, 40 CFR 52.21, and 40 CFR 51.165). In addition, a major or minor PTC applicability determination (18 AAC 50.302 and 18 AAC 50.502) is needed. DU would also be subject to a Hazardous Air Pollutant (HAP) major modification determination (18 AAC 50.316 and 40 CFR 63). Any PTC required would also represent Title V modifications needed for new stationary sources. If required, the permitting process would help ensure emissions from the facility would not significantly affect the status of the air quality region.

Construction

Construction emissions are primarily from mobile and fugitive sources that would not be considered for stationary source modification determinations. Table 4.7.d illustrates the potential construction emissions per year based on a conservative approach of using a 10-month construction year to complete all construction. Yearly emissions were estimated using the total footprint and new building provided in Tables 2.5.a and 2.5.d. The probable emissions for construction activities are not expected to cause or contribute to a violation or attainment of the NAAQS for Fairbanks. Localized impacts from fugitive dust may occur, but dust abatement measures at project sites would be used as BMPs to minimize dust problems.

TABLE 4.7.d
Potential Emissions from Construction at Fort Wainwright in Tons per Year, Alternative 2
USARAK Aviation EIS

Location	CO	NO_x	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	15.2	13.3	0.3	4.1	1.6

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.

Operations and Maintenance of Facilities

Table 4.7.e presents estimates of emissions from stationary sources once the facilities are constructed. Three distillate-fired emergency generators are assumed to be needed for two new hangars and the deluge system potentially operating at 500 non-emergency hours per year for testing and maintenance. It was assumed that the new buildings would be placed on the existing CHPP utility grid. The increased demand is expected to be absorbed by the CHPP without affecting the maximum allowable coal consumption or increasing any NAAQS-compliant emission limits currently regulated by DU's Title V air operating permit.[1] DU, which is responsible for the operation of the CHPP and supplying heat and power to sustain the mission of FWA, is also responsible for the Title V operating permit and the federal requirements within the permit to maintain the NAAQS. Current emissions rates are expected to be reduced and the overall CHPP capacity increased with improvement projects planned, as stated in Subsection 3.1.2.7.2. In addition to the CHPP, the new emergency generators would fall under the permit responsibility of DU.

[1] Personal communication with FWA Air Quality officials, March 6, 2009. NAAQS-compliant emission rates are premised on a maximum coal consumption of 336,000 tons per consecutive 12-month period based on DU's #AQ1121TVP01 permit. Current 3-year average usage is approximately 220,000 tons per year.

TABLE 4.7.e
Potential Emissions from Operation of Stationary Sources at Fort Wainwright in Tons per Year, Alternative 2
USARAK Aviation EIS

Source	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Generators	1.0	4.7	0.3	0.3	0.4
Painting					1.00
Total	1.0	4.7	0.3	0.3	1.4
Minor PTC Modification Significance Threshold	100	10	10	15	none

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.
Minor PTC threshold is for PM_{10}. There is no threshold value for $PM_{2.5}$ or VOCs.

EPA emission factors were used to calculate the potential emissions for the emergency generators. Generator sizes were assumed equivalent to similar sources currently installed at FWA. VOC emissions from painting associated with any maintenance facilities are also included in the table and were derived from potential emission calculations for similar sources at FWA. The emissions shown in Table 4.7.d are below the minor PTC significance threshold values, which are the smallest significance thresholds for new stationary sources. In addition, HAP emissions are expected to be less than 100 pounds per year from these possible new sources, well below regulatory concern. Potential emission increases due to operating and maintaining new facilities under Alternative 2 would not be expected to cause or contribute to a violation or attainment of the NAAQS for Fairbanks.

4.7.2.2.4 Military Training

Alternative 2 would result in increased helicopters and ground support equipment stationed at FWA as well as additional training operations. Helicopter emissions within the Interior training areas were estimated by modeling fuel consumption and takeoff and landing events at Allen AAF. Emission increases as a result of Alternative 2 are shown in Table 4.7.f and were modeled using the Emission Dispersion Modeling System (EDMS) FAA tool used to model mobile source associated with airports,. The emissions in Table 4.7.f include aircraft ground support equipment used at the airfield where the helicopters are stationed. Modeling assumptions and results for FWA are provided in Appendix D, with the number of increased operations from Alternative 2 and Alternative 3 being the same. Allen AAF emissions are conservatively estimated assuming Alternative 3 modeling parameters of no aircraft ground support equipment and 1,664 takeoff and landing operations for aircraft stationed at FWA and Eielson AFB.

TABLE 4.7.f
Emissions from Helicopter Training in Tons per Year, Alternative 2
USARAK Aviation EIS

Location	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	3.11	1.72	0.49	0.22	1.4
Allen AAF	0.89	0.87	0.06	0.06	0.14

Note: PM emissions are conservatively estimated to be equivalent to SO_2 emissions because emission factors for PM are not available for some military engines.

Helicopter training in FNSB and in the Interior training areas air space would have little impact on ambient air quality in these air spaces. Helicopter emissions within the flight corridors would be comparable to the quantities shown in Table 4.7.f. Emissions are well below significant thresholds and would have minor to no impact on ambient air in the flight corridor air regions.

4.7.2.3 Alternative 3: Combat Aviation Brigade

4.7.2.3.1 Aviation Personnel

Additional aviation personnel and civilian employees would be assigned to FWA, FRA, and Eielson AFB under Alternative 3. Emissions from commuter traffic associated with these employees are included as an indirect emission source. Anticipated commuter distances, trips, and parking associated with daily operations were estimated for each installation. Assumptions are outlined in the emission calculations provided in Appendix D. Probable emissions were estimated using vehicle emission rates from EPA's Mobile 6 and are shown in Table 4.7.g.

TABLE 4.7.g
Potential Indirect Emissions from Vehicles in Tons per Year, Alternative 3
USARAK Aviation EIS

Location	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	29.30	2.85	0.04	0.12	1.61
Fort Richardson	21.02	2.17	0.02	0.08	1.35
Eielson AFB	61.10	6.48	0.05	0.21	3.39

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.

The probable emissions from vehicles at each installation are minor compared to the area vehicle emissions burdens in each air quality region, and are not expected to cause or contribute to a violation of the NAAQS. Commuter emissions would not impact the ability of Fairbanks to achieve attainment status for $PM_{2.5}$ because the emissions levels of $PM_{2.5}$ and its precursor are a fraction of the significance threshold of 100 tpy.

4.7.2.3.2 Aviation Assets

Under Alternative 3, additional helicopter, vehicle, and generator assets would be assigned to FWA, FRA, and Eielson AFB to support the CAB. The use of helicopters would be for military training activities, and the environmental effects for increased helicopter activity are addressed in Subsection 4.7.2.3.4.

Additional military vehicles and generators would be assigned to the CAB units as part of Alternative 3, and used to support the mission requirements for the CAB. The generators, although greater in number as compared to Alternative 2, would still have no significant impact to ambient air quality based on the same principles, size, and limited hours of operation. The military vehicle assets would also have little impact on the NAAQS for the Interior training and FNSB Routine air quality regions. The amount of vehicles is approximately one-half of the similar types of vehicle assets presented in the USARAK Transformation EIS, which was deemed no significant impact. Concerning conformity analyses, the routine transport of material and personnel and the routine operation of mobile assets and equipment are considered de minimis activities (40 CFR 51.853). Localized particulate matter events may be present in training exercises but would not contribute to a violation of the NAAQS.

4.7.2.3.3 Facilities Construction and Demolition

Under Alternative 3, construction and operation of new facilities and demolition of existing facilities would only occur at FWA. Based on the analysis completed for Alternative 3 (the worst-case scenario) provided in Appendix D, construction and demolition activities are not expected to adversely affect ambient air quality. Additionally, the operation of new stationary sources under the FWA or DU Title V permits would also not adversely affect ambient air quality in the Fairbanks air quality region. FWA and DU would be subject to the same regulations outlined in Subsection 4.7.2.2.3 when installing new stationary sources under Alternative 3.

Construction

Construction emissions are primarily from mobile and fugitive sources that would not be considered for stationary source modification determinations. Table 4.7.h illustrates the potential construction emissions per year based on a conservative approach of using a 10-month construction year to complete all construction. The probable emissions for construction activities are not expected to cause or contribute to a violation or attainment of the NAAQS for Fairbanks. Localized impacts from fugitive dust may occur, but dust abatement measures at project sites would be used as BMPs to minimize dust problems.

TABLE 4.7.h
Potential Emissions from Construction at Fort Wainwright in Tons per Year, Alternative 3
USARAK Aviation EIS

Location	CO	NO_x	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	20.3	17.7	0.4	5.4	2.1

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.

Operations and Maintenance of Facilities

Table 4.7.i presents estimates of emissions from stationary sources once the facilities are constructed. Three distillate-fired emergency generators are assumed to be needed for two new hangars and the deluge system potentially operating at 500 non-emergency hours per year for testing and maintenance. It was assumed that the new buildings would be placed on the existing CHPP utility grid. As with Alternative 2, the increased demand is expected to be absorbed by the CHPP without affecting the maximum coal consumption limit or

increasing any NAAQS-compliant emission limits currently regulated by DU's Title V air operating permit.[2] Current emissions rates are expected to be reduced and the overall CHPP capacity increased with improvement projects planned, as stated in Subsection 3.1.2.7.2. The new emergency generators would also fall under the permit responsibility of DU.

TABLE 4.7.i
Potential Emissions from Operation of Stationary Sources at Fort Wainwright in Tons per Year, Alternative 3
USARAK Aviation EIS

Source	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Generators	1.0	4.7	0.3	0.3	0.4
Painting					1.00
Total	1.0	4.7	0.3	0.3	1.4
Minor PTC Modification Significance Threshold	100	10	10	15	None

Note: $PM_{2.5}$ emissions are conservatively estimated to be equivalent to PM_{10} emissions because accurate emission factors for $PM_{2.5}$ are limited.
Minor PTC Threshold is for PM_{10}. There is no threshold value for $PM_{2.5}$ or VOC.

EPA emission factors were used to calculate the potential emissions for the emergency generators. Generator sizes were assumed to be equivalent to similar sources currently installed at FWA. VOC emissions from painting associated with any maintenance facilities are also included in the table and were derived from potential emission calculations for like sources at FWA. The emissions shown in Table 4.7.i are below the minor PTC significance threshold values, which are the smallest significance thresholds for stationary sources. In addition, HAP emissions are expected to be less than 100 pounds per year for these possible new stationary sources, well below regulatory concern. Potential emission increases due to operating and maintaining new facilities under Alternative 3 would not be expected to cause or contribute to a violation or attainment of the NAAQS for Fairbanks.

4.7.2.3.4 Military Training

Alternative 3 would result in increased helicopters and ground support equipment stationed at FWA, FRA, and Eielson AFB, and additional training operations at FWA, FRA, Eielson AFB. Training operations in the Interior training areas are represented by emission calculations at Allen AAF. Emission increases as a result of Alternative 3 are shown in Table 4.7.j and were modeled using EDMS. The emissions in Table 4.7.j include ground support equipment used at the airfield where the helicopters are stationed. Modeling assumptions for FWA are given in Appendix D. Allen AAF modeling assumes no aircraft ground support equipment and 1,664 operations for aircraft stationed at FWA and Eielson AFB. Eielson AFB modeling assumes 50 percent aircraft ground support equipment for 960 operations of the Apache AH-64 proposed to be stationed at the Base.

[2] Personal communication with FWA Air Quality officials, March 6, 2009. NAAQS-compliant emission rates are premised on a maximum coal consumption of 336,000 tons per consecutive 12-month period based on DU's #AQ1121TVP01 permit. Current 3-year average usage is approximately 220,000 tons per year.

TABLE 4.7.j
Emissions from Helicopter Training in Tons per Year, Alternative 3
USARAK Aviation EIS

Location	CO	NO_X	SO_2	$PM_{10}/PM_{2.5}$	VOC
Fort Wainwright	3.11	1.72	0.49	0.22	1.4
Fort Richardson	7.01	6.13	0.87	0.87	6.07
Eielson AFB	1.27	1.14	0.16	0.16	1.08
Allen AAF	0.89	0.87	0.06	0.06	0.14

Note: PM emissions are conservatively estimated to be equivalent to SO_2 emissions because emission factors for PM are not available for some military engines.

Helicopter training in FNSB and in the Interior training areas air space would have little impact on ambient air quality. Helicopter emissions within the flight corridors would be similar to the quantities shown in Table 4.7.j and would also have little impact on ambient air in the flight corridor air regions.

The increase in FRA emissions is minor compared to the total emissions from aircraft training missions flown from Elmendorf AFB, which shares a common fence line with the MOA CO maintenance area. FRA indirect emission increases from helicopters should not cause or contribute to a violation of the NAAQS.

4.7.2.4 Summary of Impacts

Table 4.7.k presents a comparative summary of how the alternatives would affect air quality for each Proposed Action alternative, based upon the significance criteria defined in Table 4.7.a.

TABLE 4.7.k
Comparative Summary of Impacts by Alternative for Air Quality
USARAK Aviation EIS

Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Increase in air pollution above the NAAQS	There would be no additional impact to NAAQS.	The increase in CO, $PM_{2.5}$, NO_x, SO_2, and VOC emissions would be below the 100-tpy threshold.	The increase in CO, $PM_{2.5}$, NO_x, SO_2, and VOC emissions would be below the 100-tpy threshold.
		Stationary source emission increases are below major and minor modification thresholds.	Stationary source emission increases are below major and minor modification thresholds.
Contribute to an existing violation of the NAAQS	Fairbanks and Anchorage are maintenance areas for CO. Fairbanks has been designated nonattainment for $PM_{2.5}$.	The increase in CO, $PM_{2.5}$, NO_x, SO_2, and VOC emissions would be below the 100-tpy threshold.	The increase in CO, $PM_{2.5}$, NO_x, SO_2, and VOC emissions would be below the 100-tpy threshold.
		Stationary source emission increases are below major and minor modification thresholds.	Stationary source emission increases are below major and minor modification thresholds.

4.7.2.5 Greenhouse Gas Emissions

The greenhouse effect is the result of heat absorption by certain gases in the atmosphere (called greenhouse gases because they effectively "trap" heat in the lower atmosphere) and re-radiation downward of some of that heat. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide (CO_2) and other trace gases. Human activity has been increasing the concentration of greenhouse gases (GHGs) in the atmosphere (mostly CO_2 from combustion of coal, oil, and gas, as well as a few other trace gases). The global concentration of CO_2 in our atmosphere today far exceeds the natural range over the last 650,000 years. Global surface temperatures have increased about 0.74°C (plus or minus 0.18°C) since the late 19th century, and the linear trend for the past 50 years of 0.13°C (plus or minus 0.03°C) per decade is nearly twice that for the past 100 years (NOAA, 2009).

Alternatives 2 and 3 will emit GHGs to the earth's atmosphere from vehicles and other associated emissions at FWA. Alternative 3 would also emit GHGs at FRA and Eielson AFB because of the stationing of Soldiers and helicopters at these locations. Military activities at these installations could result in an increase in CO_2 emissions due to reductions in vegetative cover, additional energy generation associated with energy service to additional buildings, and additional vehicles at the installations. These conditions would occur under all alternatives, including Alternative 1. Nonetheless, only some of these emissions would represent a net increase in global GHG emissions, as many of these emissions already take place and are merely relocating to Alaska. Therefore, the net change to GHG concentration in a regional or global context is virtually unchanged.

It is also important to place any potential carbon emissions associated with the Proposed Action in the context of the Army's participation in the federal government's overall plan to reduce carbon emissions. Executive Order 13423 sets as a goal for all federal agencies the improvement in energy efficiency and the reduction of GHG emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline to the agency's energy use in fiscal year 2003. The U.S. Army Energy Strategy for Installations (DoD, 2005b) also contains strategies to reduce energy waste and improve efficiency.

According to EPA's Office of Air and Radiation,

> *To date, research on how emissions of CO_2 and other GHGs influence global climate change and associated effects has focused on the overall impact of emissions from aggregate regional or global sources. This is primarily because GHG emissions from single sources are small relative to aggregate emissions, and GHGs, once emitted from a given source, become well mixed in the global atmosphere and have a long atmospheric lifetime. The climate change research community has not yet developed tools specifically intended for evaluating or quantifying end-point impacts attributable to the emissions of GHGs from a single source, and [EPA is] not aware of any scientific literature to draw from regarding the climate effects of individual, facility-level GHG emissions.*

Current measurements and modeling can observe and verify warming at global to continental scales. Climate, and correspondingly environmental, impacts, are observed on a local level, but cannot be modeled at this time using existing models. It is currently beyond

the scope of existing science to connect a specific source of GHG emissions with specific climate impacts at an exact location (USGS, 2008).

Based on the limitations on available science in determining environmental impacts from a single source of additional GHG emissions, any such impacts from the Proposed Action cannot be determined with scientific confidence and, therefore, cannot be analyzed in this EIS.

4.7.3 Mitigation

There are no significant adverse environmental impacts to air quality anticipated under the Proposed Action. Best practices designed to maintain the minimal impacts to air quality from the Proposed Action are listed below.

4.7.3.1 Facility Construction, Demolition, and Operations

- Establish and implement a dust control plan to reduce impacts from fugitive dust during construction
- Re-evaluate need for construction and/or operating air quality permit modifications based on final site selection and design prior to start of construction (USARAK, 2004a)
- Submit construction permit applications to ADEC as required and appropriate (USARAK, 2004a)
- Conduct air quality permit compliance audits (USARAK, 2004a)

4.7.3.2 Military Training Activities

- Abide by USARAK's Air Quality Management Program (USARAK, 2004a)
- Collect localized air quality sampling parameters to assess training impacts (USARAK, 2004a)

4.8 Socioeconomics

This section presents the environmental analysis of potential impacts to the economies and public services of Fairbanks and Anchorage as a result of implementing any of the alternatives.

4.8.1 Significance Criteria

The evaluation criteria for socioeconomics (described in Section 3.8) include those for population, economic activity, housing, and public services (see Table 4.8.a). These criteria are the basis of the significance criteria used to assess the potential impacts of the action alternatives compared with the No Action alternative. Subsection 4.8.2 provides an analysis of alternatives compared to the significance criteria.

TABLE 4.8.a
Socioeconomics Significance Criteria
USARAK Aviation EIS

	Criterion	
Topic	**Adverse Effect**	**Significant Adverse Effect**
Population	Population growth or decline can result in adverse, neutral, or beneficial impacts depending on the affected community. Population decline is more likely to be perceived as an adverse impact. Growth is adverse when it appreciably affects demand for housing and public services (see below).	A significant adverse impact would result from changes in population levels (particularly declines) that appreciably exceed typical historic fluctuations.
Economic Activity	Decreases in employment, income, or business volume are adverse, while increases are generally beneficial. (An exception would be a rapid increase in a small or rural economy that results in a "boom-town" effect, especially if that growth could be followed by a rapid decrease.)	A significant adverse impact would result from changes in these economic indicators at levels exceeding typical historic fluctuations.
Housing and Public Services	Changes in population-driven demand for housing (vacancy rates), schools, and other public services can result in adverse impacts. Increased demand is more likely to be adverse, but decreased demand that results in lower funding can be adverse.	A significant adverse impact would result from changes in demand that are likely to strain available resources to the point that leads to substantially greater delays in finding available housing, or requires substantial modification of public school building capacity or other public services.

4.8.2 Environmental Consequences for Socioeconomics

This section identifies the direct and indirect impacts of the alternatives on socioeconomics.

4.8.2.1 Alternative 1: No Action

4.8.2.1.1 Aviation Personnel

Under the No Action alternative, additional Soldiers, dependents, and civilian personnel would not be stationed in the study area. Soldiers would continue to be stationed at their current locations. FWA and Eielson AFB would continue to be important and beneficial influences on the Fairbanks regional economy; FRA would continue contributing to the Anchorage Metropolitan Statistical Area (MSA) economy. No additional indirect jobs or income would be generated in the regional economies.

Because the population would not increase, no additional indirect demand for housing, schools, and related public services would be generated, and existing trends would likely continue. Existing resources are sufficient to support existing needs, with the exception of Army family housing at FWA and unaccompanied housing at FRA, which are currently in tight supply. Sufficient rental housing is available in the Fairbanks area to accommodate families that could not be housed on the installation. Temporary, relocatable unaccompanied housing would continue to be used to address the shortage of barracks spaces at FWA.

4.8.2.1.2 Aviation Assets

No additional aviation and related training assets, such as helicopters, vehicles, and generators, required to implement the Proposed Action would be purchased under the No Action alternative.

4.8.2.1.3 Facilities Construction and Demolition

Under the No Action alternative, construction of family housing and barracks on FWA (as well as other facilities at FWA, FRA, and Eielson AFB) would continue as currently planned and programmed. These and other construction projects would continue to indirectly increase temporary employment and income within the local area, ceasing when construction is completed.

The quality and availability of family housing on FWA would improve as new housing units are completed in 2009 and as the Army's Residential Communities Initiative (RCI) program begins to renovate and replace aging military housing at FWA (USACE, 2008).

4.8.2.1.4 Military Training

Current military training activates conducted under the No Action alternative would not result in impacts to socioeconomic resources (USARAK, 2004 and USARAK, 2006). Existing military training activities would continue to have minor impacts to hunting and fishing opportunities on military training lands because these areas are closed to recreational activities when military training is occurring. The value of this loss depends on the extent and duration of training closures. The worst-case scenario (no public access during prime hunting) would result in a maximum loss of $3.5 million for hunting (USARAK, 2004). Fishing would be impacted much less because fish stock could be placed in other area lakes not subject to restrictions.

The beneficial indirect current economic contributions of Army spending for ongoing O&M would continue.

4.8.2.2 Alternative 2: Aviation Task Force

4.8.2.2.1 Aviation Personnel

Population

Under Alternative 2, an additional 710 aviation personnel would be stationed at FWA, an increase of 45 percent from 490 aviation personnel under the No Action Alternative (see Table 2.5.a). There would be no change in aviation personnel at FRA or Eielson AFB under this alternative.

An estimated 995 family members would accompany the aviation personnel at FWA, based on historical average of 1.4 dependents per military personnel at these installations (Table 2.5.a). An estimated 300 civilian staff (federal employees and private contractor employees) would be needed for administrative and other support, based on the historical ratio at FWA. The additional civilian staff would either be hired from the local economy or be brought in by the Army from other locations, depending on the skills needed.

Altogether, approximately 1,705 Soldiers and family members would be added to the FNSB population, which would be nearly 2 percent of the borough's estimated population in the

2006 Census. This would be a minor increase compared to the more than 14 percent growth[3] in the FNSB since the 2000 Census, 3 percent of which was due to growth from approximately 2,400 military personnel and dependents at FWA in 2005. Civilians brought in from other locations would represent a negligible increase in residential population. Overall, population growth due to stationing the Task Force at FWA would not exceed previous historical fluctuations. No direct adverse effect to population is anticipated; indirect population-related effects are discussed under Housing and Public Services.

Economic Activity

Under Alternative 2, a direct employment increase of 1,010 military and civilian personnel is anticipated at FWA (see Table 2.5.a). Using a conservative employment multiplier of two indirect jobs per each direct job at FWA (USARAK, 2004), this would result in approximately 2,020 people being indirectly employed in supporting industries throughout the Fairbanks region.

Using average salaries (in 2005 dollars) for personnel at FWA, the projected additional FWA payroll would be $66.4 million. Based on historical averages for FWA (Garrison) operational expenditures for goods and services such as utilities, office supplies, maintenance, etc., the personnel increase would require additional non-payroll expenditures of $22.4 million. Based on a conservative estimate of 20 jobs per million dollars of non-payroll expenditures (USARAK, 2004), this would generate approximately 449 indirect jobs and $131.5 million in total economic activity in the Fairbanks area, resulting in a minor (about 3 percent) but beneficial impact to economic activity when compared to the total output for the Fairbanks MSA of $4,612 million (BEA, 2009). The slight increase in employment, income, or business volume under this alternative would not substantially exceed typical historical fluctuations in Fairbanks.

There would be no change in economic activity at FRA or Eielson AFB under this alternative because aviation stationing would only occur at FWA.

Housing and Public Services

Housing. An estimated 398 (56 percent) of the 710 Aviation Task Force Soldiers stationed at FWA would require family housing, either on the installation or in the community, based on an historical averages (Davis, 2009, personal communication) (see Table 4.8.b). Given FWA's 2005 official housing requirement, the current goal of the family housing program is to provide housing on FWA for approximately 50 percent of accompanied Soldiers (Larson, personal communication, 2009). Adding the additional 199 families under Alternative 2 to the 1,800 existing families meeting the same criteria, the estimated demand for housing on FWA would be nearly 2,000 families, or about 311 more than the projected inventory of 1,689 family housing units at the end of the RCI's 5-year *Initial Development Plan* in 2014.

Sufficient housing would be available in the Fairbanks area to accommodate the families associated with the stationing of the Task Force that could not be housed on the installation. As of June 2008, there were 295 vacant housing units with three or more bedrooms. (It should be noted that many of these families are already living in the area due to temporary Task Force stationing that began in 2006.) Families living off FWA could face higher housing

[3] The 14 percent includes the U.S. Census Bureau's 2008 adjustments to annual population estimates since the 2000 Census. Some of that additional population may have been present but not counted in the 2000 Census.

costs than those living in privatized housing on FWA, where rents are linked to the basic allowance for housing (BAH). Through 2014, families assigned to FWA could also face longer periods spent in temporary lodgings while awaiting housing on FWA, due to the ongoing demolition/renovation/replacement of Army family housing at FWA under the RCI *Initial Development Plan*. The Preferred Tenant Program would assist Soldiers in obtaining private sector housing.

TABLE 4.8.b
Anticipated Family Housing Needs for Alternative 2
USARAK Aviation EIS

	Aviation Task Force	Other Military	Total
Soldiers	710	6,432	7,142
Accompanied (56%)	398	3,602	4,000
To be provided housing (50%)	199	1,801	2,000
Projected family units 2014			1,689
Over/under			-311

Sources: Plans, Analysis and Integration Office (PAIO), 2009a; RCI Environmental Assessment (EA) (USACE, 2008) personal communications (Davis, 2009, personal communication; and Layton, 2009, personal communication).

Based on the same planning factor (44 percent unaccompanied), an estimated 312 unaccompanied Soldiers associated with the Task Force would require housing on FWA, for a total of 2,830 including other military stationed at FWA. The current inventory of 2,798 barracks beds at FWA would be unable to meet the additional demand in the short term. (It should be noted that many of these Soldiers have been temporarily stationed at FWA since 2006, but that most of them are currently deployed overseas, along with most of the Stryker Brigade. Relocatable unaccompanied personnel housing (UPH) have been used to fill the gap.)

However, sufficient barracks space would be available at FWA following construction of a 294-Soldier UPH barracks as a part of Alternative 2. That project would begin in the first year of the proposed construction period and would be ready for occupancy in late 2011 (Davis, 2009). In the interim, temporary, relocatable UPH or additional beds per room in existing barracks would continue to be used.

No additional accompanied or unaccompanied Soldiers would be stationed at either Eielson AFB or FRA under Alternative 2.

Schools and Other Services. Based on historical data, up to approximately 355 additional Army children would attend FNSB schools. Overall, the FNSB school district would see a 2.7 percent increase in student population associated with the stationing of the Task Force at FWA. Of that total, assuming 50 percent of eligible families would be housed on FWA, approximately 178 children would attend FWA schools (including the schools located off the installation that serve children living on FWA). That is about 5 percent of the 2008-2009 capacity of those schools, which are currently at 81 percent capacity. No redistricting or additional school facilities would be required and no adverse effect on FNSB school capacity would result.

Overall, some additional demand for medical and other public services are likely to occur in the Fairbanks area, primarily as a result of the additional Soldiers and their families that would live within the community, but would not be expected to strain the available resources to the point that substantial expansion would be necessary.

There would be no change in schools or other public services needs at FRA or Eielson AFB under this alternative because aviation stationing would only occur at FWA.

4.8.2.2.2 Aviation Assets

Aviation and related training assets, including helicopters, vehicles, and generators, required to implement the Proposed Action would be purchased from suppliers located (manufacturing operations) elsewhere in the United States. Therefore, no local or regional economic benefit would be realized in the Fairbanks or Anchorage regions.

4.8.2.2.3 Facilities Construction and Demolition

Construction and Demolition

Alternative 2 would include construction of new hangars and other facilities and demolition of three smaller buildings at FWA, as detailed in Subsection 2.5.2, to support the stationing of an Aviation Task Force. Estimated costs of planned construction would be approximately $420 million over a 4-to-5-year period (Davis, 2009). In the Fairbanks area economy, direct construction costs combined with indirect economic effects would result in a short-term total economic benefit of approximately $500 million, including payroll for approximately 670 full-time-equivalent construction jobs. The indirect economic benefit would be distributed over each successive phase. The slight increase in employment, income, or business volume under this alternative would not substantially exceed typical historic fluctuations in Fairbanks.

Operations and Maintenance

The facilities associated with Alternative 2 are required to support the increase in aviation personnel (and others). O&M of the facilities associated with Alternative 2 would result in ongoing beneficial, but minor, effects on the economy of the Fairbanks region. The estimated expenditures for maintenance and repair of these new facilities would be about $3,236,283 per year, excluding utilities, with proportionate indirect economic benefits. This would result in a beneficial but minor effect on the regional economy.

There would be no change in economic activity related to construction or maintenance activities at FRA or Eielson AFB under this alternative, as aviation stationing would only occur at FWA.

4.8.2.2.4 Military Training

Under Alternative 2, helicopter activity and military training exercises would occur within cantonment and non-cantonment areas. Primary activities occurring within FWA's cantonment area are helicopter takeoffs and landings from Ladd AAF. Aerial training operations under Alternative 2 would primarily be conducted in non-cantonment areas. Helicopter flights from FWA's cantonment area to adjacent training lands would occur within existing flight corridors. Helicopter training activities would be conducted within existing airspace and would utilize existing Army training ranges (see Subsection 2.3.4).

Increased levels of training exercises under this alternative would result in decreased recreational access to USARAK training lands and are expected to have a minor impact (USARAK, 2004). The value of this loss depends on the extent and duration of training closures. The worst-case scenario (no public access during prime hunting) would result in a maximum loss of $3.5 million for hunting (USARAK, 2004). Fishing would be impacted much less because fish stock could be placed in other area lakes not subject to restrictions. Several mitigation measures have been implemented to maximize access to areas safe for public use during training exercises (USARAK, 2004; USARAK, 2006).

The O&M related to additional helicopters and training exercises would result in additional expenditures for procurement of materials and services. Indirectly, this would increase economic activity, employment, and income in the Fairbanks region and beyond. Economic effects would be beneficial but minor.

There would be no change in any socioeconomic indicator related to military training at FRA or Eielson AFB under this alternative, as aviation stationing would only occur at FWA.

4.8.2.3 Alternative 3: Combat Aviation Brigade

4.8.2.3.1 Aviation Personnel

Population

Under Alternative 3, up to an additional 2,360 aviation personnel would be stationed at USARAK facilities, mostly at FWA, with the remainder at FRA and Eielson AFB. This represents an approximately 60 percent increase in military personnel.

An estimated 3,200 family members would accompany the aviation personnel. An estimated 1,035 civilian staff (federal employees and private contractor employees) would be needed for administrative and other support; this projection is based on average ratios at FWA, FRA, and Eielson AFB. The additional civilian staff would either be hired from the local economy or be brought in by the Army from other locations, depending on the skills needed.

About 60 percent of this additional workforce and residential population would be at FWA and about 20 percent would be at each of FRA and Eielson AFB, based on initial plans for stationing (see Subsection 2.5.3). Under Alternative 3, approximately 4,520 Soldiers and family members would be added to the FNSB related to FWA and Eielson AFB, which would be 4.8 percent of the U.S. Census Bureau's population estimate for 2006. Civilians brought in from other locations would likely represent a negligible increase in residential population. Growth associated with this alternative would not exceed FNSB's previous historic growth of more than 14 percent since the 2000 Census (3 percent of which was due to military growth). No direct adverse effect to population is anticipated; indirect population-related effects are discussed under Housing and Public Services.

The FRA-related population increase in the Anchorage MSA would be similar to the reduction in population caused by the relocation of personnel from FRA to FWA in recent years under the Army's Transformation program, or less than 1 percent of the 2006 population. This would result in a minor impact to the population compared to the 12.5 percent growth from 2000 to 2006, and is consistent with typical historical variations.

Economic Activity

Under Alternative 3, a direct employment increase of up to 3,185 people is anticipated (2,360 military and 1,035 civilian personnel). The projected total indirect employment increase would be approximately 4,990 in the Fairbanks region and 2,400 in the Anchorage MSA.

The estimated increase in payroll would be $126 million at FWA and $30 million at Eielson AFB. Increases in non-payroll expenditures of $43 million at FWA and $14 million at Eielson AFB would be expected, based on historical averages. This would indirectly result in an additional 1,134 jobs in the Fairbanks area. Adding the indirect employment generated by direct employment and employment effects from non-payroll expenditures, a total indirect increase in 6,124 jobs would be expected under Alternative 3.

As dollars are circulated through the economy, further rounds of spending for other goods and services result, referred to as the multiplier effect. For USARAK, the multiplier is $1.98 for every dollar in direct payroll (USARAK, 2004). Total economic activity generated by Alternative 3, including direct payroll and non-payroll expenditures at FWA and Eielson AFB and the indirect effects from each would be approximately $572 million in the FNSB. Overall, effects on the regional economy would be beneficial.

Similarly, direct employment of approximately 690 people at FRA and $18.5 million in non-payroll expenditures would generate approximately 1,750 indirect jobs and $120 million in total economic activity in the Anchorage MSA, resulting in a minor but beneficial impact to economic activity and would not substantially exceed typical historic fluctuations in the Anchorage economy.

Housing and Public Services

Housing. Based on initial plans for stationing, approximately 60 percent of the Soldiers associated with the CAB would be stationed at FWA and about 20 percent each at FRA and Eielson AFB. Using historical averages, an estimated 827 of the 1,476 Soldiers who would be stationed at FWA and 248 of the 442 Soldiers stationed at Eielson AFB (56 percent) would require family housing in the Fairbanks area, either on FWA or in the community, and the remainder would require barracks space. In the Anchorage area, an estimated 248 of the 442 Soldiers assigned to FRA would require family housing and the remainder would require barracks space.

Table 4.8.c illustrates the anticipated family housing demand at FWA. Based on FWA's 2005 official housing requirement, the current goal of the family housing program is to provide housing for approximately 50 percent of accompanied Soldiers on FWA (Larson, 2009, personal communication). Adding these additional families under Alternative 3 to the 1,800 existing families meeting the same criteria, the estimated demand for housing on FWA would be 2,214 families or about 525 more than the projected inventory of 1,689 family housing units at the end of the RCI's 5-year *Initial Development Plan* in 2014.

TABLE 4.8.c
Anticipated Family Housing Needs for Alternative 3
USARAK Aviation EIS

	Combat Aviation Brigade	Other Military	Total
Soldiers	1,476	6,432	7,908
Accompanied (56%)	827	3,602	4,428
To-be-provided housing (50%)	413	1,801	2,214
Projected family units 2014			1,689
Over/under			-525

Sources: PAIO, 2009a; RCI EA (USACE, 2008); personal communications (Davis, 2009, personal communication; and Layton, 2009, personal communication).

Families living in surrounding communities could face higher housing costs than those living in privatized FWA housing, where rents are linked to the BAH. Through 2014, families assigned to FWA could also face longer periods spent in temporary lodgings while awaiting FWA housing, due to the ongoing demolition/renovation/replacement of Army family housing at FWA under the RCI *Initial Development Plan*. The Preferred Tenant Program would assist Soldiers in obtaining private sector housing. Moderately adverse indirect effects on the availability and cost of rental housing in the community could occur as a result of the increased demand.

There is a surplus of military family housing available at both FRA/Elmendorf AFB (260 units) in Anchorage and Eielson AFB (400 units) in Fairbanks, which would be sufficient to absorb the 248 (64 percent of 462) accompanied Soldiers associated with the CAB to be stationed at both FRA and Eielson AFB. Private sector housing in the Anchorage area is sufficient to absorb any additional FRA households that choose to live off of the installation.

As Table 4.8.d shows, an estimated 649 of the Soldiers associated with the CAB would require unaccompanied housing on FWA, for a total of nearly 3,500 when added to other military personnel stationed at FWA. The current inventory of 2,798 barracks beds at FWA would fall far short of that additional demand, by nearly 700 beds. Additional spaces would become available in late 2011, following construction of a 294-Soldier UPH project as a part of Alternative 3 (Davis, 2009, personal communication). Alternative 3 includes another 540-Soldier UPH facility, which is currently unfunded and, therefore, would not be available for 3 to 5 years. At the end of that project, there would be an estimated surplus of approximately 150 beds, assuming no additional stationing of military population took place during that 3- to-5-year period.

In the interim, temporary, relocatable UPH structures would be required to meet the need. These structures would take 12-18 months to purchase, ship, and site, and could not be assembled at FWA during winter months. The existing relocatable UPH, which are reaching the end of their useful life, would have to be retained until new ones could be put in place (Davis, 2009, personal communication).

TABLE 4.8.d
Anticipated Unaccompanied Personnel Housing Needs for Alternative 3
USARAK Aviation EIS

	Combat Aviation Brigade	Other Military	Total
Soldiers	1,476	6,432	7,908
Unaccompanied (44%)	649	2,830	3,480
Existing UPH beds, 2009			2,798
Over/under, 2010			-682
Additional beds after construction of two new barracks projects, 2011-2015			3,632
Over/under, 2011-2015			152

Sources: PAIO, 2009a; RCI EA (USACE, 2008); personal communications (Davis, 2009, personal communication; and Layton, 2009, personal communication).

FRA has a current UPH deficit of 417 beds (Air Force Center for Engineering and the Environment [AFCEE], 2007), which would be worsened by the need to house another 194 Soldiers (44 percent of 442) associated with the CAB. Alternative 3 does not include any additional barracks at FRA. Temporary relocatable UPH and/or putting extra beds in dormitory rooms would be necessary to address the need until another barracks project could be funded, planned, and constructed.

Eielson AFB should have enough barracks spaces to accommodate the 194 Soldiers (44 percent of 442) associated with the CAB who would be stationed there (Davis, 2009, personal communication).

Schools. Based on historical data, up to approximately 959 additional Army children would enroll in local schools in FNSB. Overall, the FNSB school district would see a 7.2 percent increase in student population associated with the stationing of the CAB at FWA.

Of that total, given that 60 percent of Soldiers would be stationed at FWA and assuming that 50 percent of eligible Army families would be housed on the installation, approximately 288 additional children would attend the schools that serve children living on FWA. Given that 20 percent of Soldiers would be stationed at Eielson AFB and assuming all of those eligible families would be housed on Base, 192 additional children would attend the schools that serve Eielson AFB residents.

That is approximately 6 percent of the 2008-2009 school-year enrollment at the FNSB schools serving families that live on FWA, which are currently at 81 percent capacity, and 3 percent for schools serving Eielson AFB, which are currently at 72 percent capacity. Anchorage schools would enroll about 192 additional Army children. That is about 2.1 percent of current enrollment in the schools serving FRA residents, which are currently at 87 percent capacity.

In adjusting to previous growth resulting from Army Transformation, the FNSB School District redefined attendance area boundaries as needed to maximize efficiency and minimize crowding in schools on FWA. Redistricting or construction of additional school facilities is not expected to be required at this time. Federal school impact aid to the FNSB

and Anchorage School Districts would increase, offsetting the costs of enrolling additional children. No adverse effect on school capacity in the FNSB or Anchorage School Districts would result from Alternative 3.

Other community services, such as shopping, medical care, and public safety resources, are fully developed in the Fairbanks and Anchorage metropolitan areas. The population increase resulting from Alternative 3 would be nearly double that of the recent Army growth in 2004 associated with the Army Transformation program. However, FWA police, fire, and medical resources would absorb an increasing share of the demand for public safety services as completion of ongoing family and barracks housing construction at FWA draws more enlisted personnel to live on the installation. Additional demand on the military services would have a minor adverse effect in the FNSB and a negligible effect in the Anchorage MSA populations as a whole.

4.8.2.3.2 Aviation Assets

Aviation and related training assets, including helicopters, vehicles, and generators, required to implement the Proposed Action would be purchased from suppliers located (manufacturing operations) elsewhere in the United States. Therefore, no local or regional economic benefit would be realized in the Fairbanks or Anchorage regions.

4.8.2.3.3 Facilities Construction and Demolition

Construction and Demolition

Under Alternative 3, construction of new hangars and other facilities would be required at FWA. Estimated costs associated with planned Aviation Task Force construction (Alternative 2) would be approximately $420 million over a 5-year period. The estimated cost for the CAB (Alternative 3) is not yet available in this early stage of planning. However, it could be roughly 1.3 times the cost of construction for the Task Force under Alternative 2, based on the relative square footage for the two sets of projects (approximately 3.2 million square feet for all phases of Brigade construction compared to 2.4 million square feet for all four phases of the Task Force construction).

Indirect effects on the regional economy of the Fairbanks area would be proportionately greater than for Alternative 2. Effects would be beneficial but temporary, stretching over at least 5 years.

Construction is not required at other USARAK facilities. Therefore, Alternative 3 would provide no beneficial construction-related effects to the Anchorage MSA economy.

Operations and Maintenance

The facilities associated with Alternative 3 are required to support the increase in aviation personnel (and others). O&M of the facilities associated with Alternative 3 would result in ongoing beneficial, but minor, effects on the economy of the Fairbanks region. Estimated maintenance costs are not yet available. However, based on relative square footage, these costs could be approximately twice the estimated cost for the Task Force facilities. Indirect effects on the regional economy of the Fairbanks area would be proportionately greater than for Alternative 2.

4.8.2.3.4 Military Training

Under Alternative 3, helicopter activity and military training exercises would occur in cantonment and non-cantonment areas. Primary activities occurring within the FWA, FRA, and Eielson AFB cantonment areas are helicopter takeoffs and landings from existing airfields and aircraft maintenance. Aerial training operations under Alternative 3 would be primarily conducted in non-cantonment areas. Helicopter flights from the cantonment area to adjacent training lands would occur within existing flight corridors. Helicopter training activities would be conducted within existing airspace and would utilize existing Army training ranges (see Subsection 2.5.3.4).

Increased levels of training exercises under this alternative would result in decreased recreational access to USARAK training lands and are expected to have a minor impact (USARAK, 2004). The value of this loss depends on the extent and duration of training closures. The worst-case scenario (no public access during prime hunting) would result in a maximum loss of $3.5 million for hunting (USARAK, 2004). Fishing would be impacted much less because fish stock could be placed in other area lakes not subject to restrictions. Several mitigation measures have been implemented to maximize access to areas safe for public use during training exercises (USARAK, 2004; USARAK, 2006).

The O&M related to additional helicopters and training exercises would result in additional expenditures for procurement of materials and services. Indirectly, this would increase economic activity, employment, and income in the Fairbanks and Anchorage regions and beyond. Economic effects would be beneficial but minor.

4.8.2.4 Summary of Impacts

Table 4.8.e presents a comparative summary of the various impacts associated with each alternative.

TABLE 4.8.e
Comparative Summary of Impacts by Alternative for Socioeconomics
USARAK Aviation EIS

Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Population	No increase in personnel or family members.	Moderate increase in personnel and family members. No direct adverse impact. (For indirect impact, see Housing).	Moderate increase in personnel and family members. No direct adverse impact. (For indirect impact, see Housing, Schools).
Economic Activity	No increase in employment or expenditures.	Minor increase in economic activity from increased employment and operational spending (minor, beneficial impact).	Moderate increase in economic activity from increased employment and operational spending (minor, beneficial impact).

TABLE 4.8.e
Comparative Summary of Impacts by Alternative for Socioeconomics
USARAK Aviation EIS

Impacts	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Housing, Schools, and Other Public Services	No additional demand for services.	Shortage of family housing at FWA, increased housing costs for Army families living off FWA. Adverse impact, less than significant.	More housing demand than for Alternative 2, worsening existing UPH shortage at FWA and FRA (adverse, less than significant). Moderate increase in public school enrollment; no new school building required (adverse, less than significant).

The preceding discussion reflects the best available information at the time of writing. Due to the ongoing fluctuations in FWA housing resources and deployments, as well as differences between federal and State estimates of FNSB population and housing, there is considerable uncertainty as to the timing and intensity of impacts.

Alternative 3, in particular, has the potential to stress community resources, especially military housing resources at FWA and FRA, adding to the effects of recent military increases due to Army Transformation in 2006. Due to the above uncertainties, it is not possible to conclude whether adverse impacts on housing would be considered significantly adverse, i.e., exactly how much the wait time for family housing or the shortage of barracks spaces would increase before they could be alleviated. Sufficient housing appears to be available in the surrounding communities for military families who must reside off military installations.

However, along with those impacts, there would be direct and indirect benefits to the regional economies, mostly in the Fairbanks area, as a result of increased employment, additional operational expenditures, and household spending by the newly assigned Soldiers and their families.

4.8.3 Mitigation

No mitigation measures are proposed for Alternative 2. A new Housing Requirements Market Analysis (HRMA) is under way at FWA. The current goal of housing 50 percent of eligible families is not ideal and this study offers an opportunity to address that.

Under Alternative 3, adverse but not significant impacts would result from overcrowding in barracks at FWA and FRA, longer wait times for Army family housing, and higher housing expenses for military families forced to live off FWA. To better evaluate the potential significance of FWA's family housing shortage, the new HRMA reports for FWA (anticipated in 2009) and FRA/Elmendorf AFB (2007) should be updated to reflect the stationing of additional personnel and new housing programmed to meet the forecasted requirement. Requirements should be carefully validated in order to realistically respond to increasing family housing needs. Units should conduct additional planning for housing unaccompanied Soldiers to prepare for deployments ending.

4.9 Soils and Permafrost

This section presents the environmental analysis of potential impacts to soils and permafrost as a result of implementing any of the alternatives.

4.9.1 Significance Criteria

The analysis of impacts on soils and permafrost was based on a review of readily available existing soil data, planning documents, and professional opinion. No original data collection was undertaken as part of this EIS.

All direct and indirect impacts to soils and permafrost were considered qualitatively in this analysis because few quantitative data are available, and many potential impacts are related to yet-unspecified site-level plans. It was assumed facility construction and operation, and training activities are the proposed activities that have the most potential to impact soils and permafrost.

The evaluation criteria for soils and permafrost (described in Section 3.9) include those for soil erosion and disturbance of permafrost resources (see Table 4.9.a). These criteria are the basis of the significance criteria used to assess the potential impacts of the action alternatives compared with the No Action alternative. Subsection 4.9.2.4 provides an analysis of alternatives compared to the significance criteria.

TABLE 4.9.a
Soils and Permafrost Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Soil Erosion	Direct or indirect impact to soils resulting in substantial soil erosion or the loss of topsoil, leading to violations of water quality standards.
Permafrost Disturbance	Direct or indirect disturbance of permafrost resources, including subsurface melt under the cantonment area and subsequent damage to facilities.

4.9.2 Environmental Consequences for Soils and Permafrost

Potential direct adverse impacts to soils and permafrost include compaction and erosion, as well as any other activities that would permanently reduce permafrost in any given location. Indirect impacts that could occur include disturbance of vegetation that could occur as a result of construction, operation, and training activities. Fugitive dust from construction is also an indirect short-term impact to air quality (see Section 4.7) and contributes to erosion on and off any given site. Temporary soil disturbance created during construction activities could also result in indirect short-term erosion and delivery of sediment to streams and wetlands (see Section 4.10).

Sources of dust, runoff silt, and other erosion debris on the Main Cantonment of FWA are managed by FWA's Erosion Control and Stream Stabilization Program (USARAK, 2007a). The program is in place to monitor and prevent damage to land, water resources, equipment and facilities, and adjacent properties. Protective vegetative cover is maintained over soils, and erosion control practices include the use of gravel, fabrics, mulch, riprap,

recycled concrete, and pavement that are environmentally safe and compatible to the site of disturbance. Check dams, windbreaks, and diversions are used to control dust and sedimentation when needed. Erosion control is also associated with water pollution, as discussed further in Section 4.10, Water Quality.

The Brigade and Task Force would be stationed primarily at the FWA Main Post, with the remaining Soldiers and aircraft stationed at the FRA and Eielson AFB cantonment areas. Training activities would be spread out among FRA, FWA, and DTA range lands.

4.9.2.1 Alternative 1: No Action

4.9.2.1.1 Aviation Personnel

Under the No Action alternative, no increase in Soldiers, dependents, or civilian personnel would occur. No change in current soil or permafrost recourses would occur as a result of the Proposed Action.

4.9.2.1.2 Aviation Assets

Under the No Action alternative, no increase in aviation assets (helicopters, vehicles, generators) would occur. The impacts to soil or permafrost would not change from existing conditions as a result of the No Action alternative.

4.9.2.1.3 Facilities Construction and Demolition

Construction

Under the No Action alternative, no additional construction activities would occur in support of either a Task Force or Combat Aviation Brigade. No adverse short- or long-term effects to soil or permafrost as a result of the Proposed Action would occur.

Operations and Maintenance

O&M at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no adverse short- or long-term adverse effects to soil or permafrost would occur as a result of the Proposed Action.

4.9.2.1.4 Military Training

Cantonment

Helicopter training exercises at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no adverse short- or long-term effects to soil or permafrost would occur to cantonment areas.

Non-Cantonment

Helicopter training exercises at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no adverse short- or long-term effects to soil or permafrost would occur to non-cantonment areas.

4.9.2.2 Alternative 2: Aviation Task Force

4.9.2.2.1 Aviation Personnel

Increased Soldiers, dependents, and civilian personnel would be present within the cantonment areas of FWA with implementation of Alternative 2. It is not anticipated that this increase in personnel would adversely affect soil or permafrost resources within

cantonment areas; therefore, no short- or long-term adverse affect to soils or permafrost is anticipated to occur. No permanent increase in Soldiers is anticipated to occur on training areas as a result of aviation activities.

4.9.2.2.2 Aviation Assets

Increased aviation assets (helicopters, vehicles, generators) would be stationed at FWA and used at USARAK training areas with implementation of Alternative 2. It is not anticipated that the increased aviation assets would adversely affect soil or permafrost resources.

4.9.2.2.3 Facilities Construction and Demolition

All new construction would occur at FWA (see Figure 2.5.b). No new construction would occur at FRA, at Eielson AFB, or on training lands. New and, in some cases, renovated buildings would be required at FWA to support the Soldiers and helicopters needed to conduct integrated aviation training under Alternative 2.

Construction

Impacts to soils and permafrost would be temporary, localized and direct from the proposed construction of facilities at FWA under Alternative 2. Permanent stationing of the Task Force under this alternative would require construction of facilities to support operational facilities, vehicle parking space, housing, and administrative offices; helicopter maintenance and warm-storage requirements. Projects under Alternative 2 are expected to result in approximately 54.6 acres of temporary disturbance to previously disturbed soils.

Soil units located within the Alternative 2 project footprint consist of urban land or developed land parcels, Tanana silt loam, and Salchaket-Typic Cryorthents complex. Urban land is the most prevalent and consists of fill used for green space and foundations, existing parking areas, buildings, and other urban structures. Management considerations in relation to construction on Tanana silt loam and Salchaket-Typic Cryorthents include presence of permafrost, high water table, ponding, flooding, and frost action. These two soil types have potential erosion hazards, resulting from wind and water, particularly when the organic mat is removed from the soil surface (NRCS, 2004).

Construction of new facilities may result in direct short-term adverse impacts to top soils and permafrost in previously undisturbed locations as a result of the removal of vegetation and disturbance of soils in the construction footprint and staging areas. Previously undisturbed soils that are exposed during construction activities may be subject to melting of permafrost and erosion by wind and water. Erosion impacts would be reduced with implementation of BMPs (see Subsection 4.9.3). Erosion impacts would be temporary because constructed structures (facilities, parking lots, landscaping) would cover the disturbed soil.

Operations and Maintenance

O&M at all installations would be similar in type to the O&M activities conducted for existing USARAK aviation units. O&M activities under this alternative would have no adverse effect on soils and permafrost because O&M activities would occur on constructed landing pads or aprons, or within facilities constructed for O&M purposes, not on barren soils. No short- or long-term adverse impacts are anticipated to occur to soils or permafrost as a result of O&M activities under this alternative.

4.9.2.2.4 Military Training

Cantonment

Helicopter training exercises, including flight O&M, would have a less-than-significant adverse impact on soils and permafrost within the cantonment areas of FWA, FRA, and Eielson AFB under Alternative 2. Maintenance activities would be conducted on constructed landing pads or aprons at the existing facilities on the installations, or newly constructed facilities at FWA. No short- or long-term adverse effects are anticipated to occur to soils or permafrost as a result of helicopter training exercises within the cantonment areas.

Training activities at small-arms ranges and IAs would impact soils through the introduction of contaminants and other debris. These contaminants are small enough in scale not to be considered a significant impact to the overall soil structure, and are analyzed in the Hazardous Materials sections. Effects to permafrost in these areas are anticipated to be limited to range infrastructure upgrades not associated with aviation asset stationing.

Non-Cantonment

Helicopter training exercises in non-cantonment areas would have no adverse effect on soils or permafrost. Training would be conducted over existing USARAK training areas. No additional off-road training is anticipated with either of the action alternatives; therefore, no direct or indirect impacts to soils or permafrost are likely to take place. Live-fire training outside the borders of the Main Cantonment, but within the boundaries of designated USARAK training areas, may impact soils via delivering additional contaminants and other debris to the soil profile.

4.9.2.3 Alternative 3: Combat Aviation Brigade

4.9.2.3.1 Aviation Personnel

Increase of Soldiers under Alternative 3 would have impacts similar to those described for Alternative 2, with the added potential to affect additional permafrost by stationing Soldiers at Eielson AFB.

4.9.2.3.2 Aviation Assets

Additional aviations assets would be stationed at FRA and Eielson AFB under Alternative 3, in addition to those added under Alternative 2. As with Alternative 2, the increased assets are not expected to adversely affect soil and permafrost resources.

4.9.2.3.3 Facilities Construction and Demolition

All new construction would occur at FWA (see Figure 2.5.c). No new construction would occur at FRA, at Eielson AFB, or on training lands. New and, in some cases, renovated buildings would be required at FWA to support the Soldiers and helicopters needed to conduct integrated aviation training.

Construction

Construction of facilities under Alternative 3 would have similar impacts to soils and permafrost as those described for Alternative 2. Permanent stationing of the Task Force under this alternative would require facilities to support 100 percent indoor hangar space for helicopters. Projects under Alternative 3 are expected to result in approximately 73.3 acres of disturbance to soils.

Operations and Maintenance
O&M activities at all installations would be similar to those described for Alternative 2.

4.9.2.3.4 Military Training

Cantonment
As under Alternative 2, helicopter training exercises, including flight O&M, would have a less-than-significant adverse impact on soils and permafrost within the cantonment areas of FWA, FRA, and Eielson AFB.

Non-Cantonment
Similar to Alternative 2, helicopter training exercises in non-cantonment areas would have no adverse effect on soils or permafrost.

4.9.2.4 Summary of Impacts

Table 4.9.b presents a comparative summary of how the alternatives would affect the significance criteria defined in Table 4.9.a. There would be no anticipated significant impacts under Alternative 2 or Alternative 3.

TABLE 4.9.b
Comparative Summary of Impacts by Alternative for Soils and Permafrost
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Soils Erosion	No increased impact	Temporary less-than-significant adverse impacts at FWA during facilities construction.	Same as Alternative 2.
Permafrost Disturbance	No increased impact	Possible temporary less-than-significant adverse impacts at FWA during facilities construction.	Same as Alternative 2.

4.9.3 Mitigation

BMPs currently in place to address hazardous materials and waste management will mitigate the effects of contaminants on soil structure at training locations. Affects to permafrost are irreversible; thus, strict avoidance of permafrost impacts is encouraged. Construction sites will be sited to avoid impacts to permafrost; however, when construction on permafrost is unavoidable, specific permafrost BMPs will be implemented.

Fugitive dust management as well as the storm water pollution prevention regulatory process will also decrease direct impacts of construction to soil erosion. FWA manages erosion according to established practices and implements standard BMPs (described in Subsection 4.9.2) as needed for erosion control. By continuing to fund the Range and Training Land Assessment program, soil resource monitoring will continue and impacts to range lands can be mitigated if identified.

Based on a comparison of alternatives and significance criteria, soil erosion and permafrost disturbance would be less than significant as a result of the Proposed Action. Impacts will further be reduced by BMPs that will be implemented to reduce adverse impacts to soils

during construction activities (e.g., minimize exposure time of soils during construction and the extent of vegetation disturbance). Disturbed soils will be revegetated following construction of facilities. Building construction will follow established codes for building on soils and permafrost resources that exist within the project footprints. With the implementation of standard construction BMPs, and following standard building practices already established on FWA, no long-term adverse impacts to soil or permafrost are anticipated to occur following construction of facilities and no further mitigation will be required.

With ongoing implementation of standard construction BMPs established by FWA for construction- and soil disturbance-related activities, no mitigation measures are required.

4.10 Water Resources (Surface Water and Groundwater)

This section presents the environmental analysis of potential impacts to water resources and water quality as a result of implementing any of the alternatives.

4.10.1 Significance Criteria

The analysis of impacts on water resources was based on a review of readily available existing water resource data, planning documents, and professional opinion. No field sampling efforts were undertaken as part of this analysis.

All direct and indirect impacts on rivers, streams, ponds and groundwater resources were determined qualitatively in this analysis, as few quantitative data are available and many potential impacts are related to yet unspecified site-level plans. It was assumed that facility construction and demolition are the primarily proposed activities that have the most potential to impact water quality.

The evaluation criteria for water resources include for the potential for changes to surface water and groundwater quality and quantity (see Table 4.10.a). These criteria are the basis of the significance criteria used to assess the potential impacts of the action alternatives compared with the No Action alternative. Subsection 4.10.2.4 provides an analysis of alternatives compared to the significance criteria.

TABLE 4.10.a
Water Resources Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Surface Water	Actions that degrade surface water or groundwater quality below established standards, or alters a floodplain.
Groundwater	Any activity that would introduce a pollutant into groundwater used for potable sources, or exceeds allocations.

4.10.2 Environmental Consequences for Water Resources

Impacts to water resources include the effects that could result from interaction with the project and the existing water resources. Potential direct adverse impacts to water quality

includes accidental release of sediments, liquids or solid waste to water resources during construction or operation of the project facilities. Potential impacts resulting from the potential release of hazardous or solid waste are discussed in Section 4.5, Hazardous Materials/Hazardous Waste. Indirect impacts that could occur include disturbance of vegetation and soils during construction, operation, and training activities causing sediment transport to water resources. Potential impacts resulting from soil disturbance are discussed in Section 4.9, Soils and Permafrost.

Watershed management on FWA is the responsibility of the USAG Alaska Department of Public Works. The Environmental Department within the Department of Public Works has the primary responsibility for this management. In addition, the U.S. Army Deputy Chief of Staff (G3) also contributes to the management of water quality (and soils) management through the Land Rehabilitation and Maintenance Program. Other programs in place to regulate and monitor water quality include the CWA, regulated by the USACE and EPA; the Safe Drinking Water Act (SDWA), regulated by the EPA; and regulations administered by ADEC such as the requirements for approval of construction designs under Section 72.600 of Title 18 of the Alaska Administrative Code (ADEC, 2007a). For construction projects, compliance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities (effective January 8, 2009) and development and implementation of a construction *Storm Water Pollution Prevention Plan* (SWPPP) are required if the area to be disturbed covers more than 1 acre.

Actions implemented by the USAG Alaska for management of water resources include a current SWPPP, which regulates storm water management for all facilities on the installations. In addition, erosion control BMPs are included in the Installation Restoration Program (IRP) (USAG-AK, 2007a) and are implemented by the installations. Temporary soil disturbance created during construction activities may result in indirect short-term erosion and delivery of sediment to streams and wetlands (see Section 3.9).

Sources of dust, runoff silt, and other erosion debris are managed by FWA's Erosion Control and Stream Stabilization Program (USAG-AK, 2007a). The program is in place to monitor and prevent damage to land, water resources, equipment and facilities, and adjacent properties. Examples of BMPs used for control of sedimentation include the use of gravel, fabrics, mulch, riprap, recycled concrete, and pavement (USAG-AK, 2007a).

4.10.2.1 Alternative 1: No Action

4.10.2.1.1 Aviation Personnel

Under the No Action alternative, no increase in Soldiers, dependents, or civilian personnel would occur. No change in current water quality or water resources would occur under this alternative. The Army and USAF would continue to comply with existing watershed management programs to minimize and/or prevent surface water and groundwater disturbance.

4.10.2.1.2 Aviation Assets

Under the No Action alternative, no increase in aviation assets (helicopters, vehicles, generators) would occur. No change in existing water resources would occur as a result of the No Action alternative.

4.10.2.1.3 Facilities Construction and Demolition

Construction and Demolition

Under the No Action alternative, temporary direct and indirect impacts to surface water quality would result from construction projects already scheduled to take place under the Army's Military Construction Program at FWA. However, because existing pollution prevention management programs are in place and would be utilized during construction activities, no adverse short- or long-term effects would occur to water resources or water quality as a result of the No Action alternative.

Operations and Maintenance

O&M at all installations would continue as currently conducted for existing USARAK and USAF military units. Under the No Action alternative, no adverse short- or long-term adverse effects to water resources or water quality would occur as a result of ongoing facilities management and upkeep activities under the No Action alternative.

4.10.2.1.4 Military Training

Current military training activities conducted under the No Action alternative result in minor impacts to water resources on military lands. Slight sedimentation from trail use and chemical decomposition of munitions constituents within designated IAs are the primary impacts associated with day-to-day training on military lands in Alaska. Several mitigation measures are in place to mitigate adverse impacts to water resources from military training (USARAK, 2004; USARAK, 2006).

4.10.2.2 Alternative 2: Aviation Task Force

4.10.2.2.1 Aviation Personnel

Increased numbers of Soldiers, dependents, and civilian personnel would occur within the cantonment area of FWA with implementation of Alternative 2, leading to increased water consumption (see Subsection 3.1.2.7.2). No increase in aviation personnel is anticipated to occur at FRA or at Eielson AFB under this alternative.

The Chena River is used for recreation and fishing activities on FWA. Increase in the use of this resource is expected to increase with additional personnel occupying the area. Adverse effects to surface water quality to the Chena River are not anticipated to occur as a result of increased personnel on Post. Water resources at FWA are currently supplied through groundwater. It is not anticipated that an increase in Soldiers, dependents, or civilian personnel under Alternative 2 would adversely affect water supply to FWA. Impacts to water resources and water quality at FWA as a result of stationing personnel are considered less than significant.

4.10.2.2.2 Aviation Assets

Increased aviation assets (helicopter, vehicle, generators) would be assigned to FWA. It is anticipated that the increased aviation assets would not adversely affect water resources.

4.10.2.2.3 Facilities Construction and Demolition

All new construction would occur on FWA (see Figure 2.5.b). No new construction would occur at FRA, at Eielson AFB, or on training lands under this Alternative.

Construction and Demolition

Impacts to water resources and water quality would be temporary and localized for the proposed construction of facilities at FWA under Alternative 2. Under Alternative 2, indirect adverse impacts to surface water resources and water quality could occur due to construction of the proposed facilities. New construction would occupy approximately 54.6 acres of FWA's cantonment area. A portion of the construction footprint is located within previously disturbed or modified areas. However, several of the larger new facilities, including the barracks and parking areas, would be located in currently unpaved areas. Construction impacts would potentially include erosion and sedimentation resulting from land disturbance (disturbance of soils and vegetation during land clearing activities to support facility construction). In addition, the potential for accidental release of hazardous materials used during construction of the proposed facilities could potentially result in adverse impacts to surface water and groundwater resources. The construction contractor would comply with EPA's NPDES General Permit for Storm Water Discharges during construction. Implementation of the construction SWPPP and standard construction BMPs to reduce sedimentation during construction would reduce the potential for accidental release of sediment and hazardous materials to surface water and groundwater resources on FWA. For example, silt fencing could be installed at the downgradient edges of a construction site to minimize offsite movement of sediment, and temporary silt ponds could be constructed at the larger construction sites to intercept and settle storm runoff prior to its leaving the site. Following the completion of construction, the site would be stabilized and any unpaved areas revegetated. Therefore, potential adverse impacts to water quality resulting from construction of facilities would be less than significant.

Three buildings would be demolished as part of Alternative 2. Any hazardous materials associated with these buildings would be handled in accordance with applicable laws, regulations, and directives. No impacts to water resources are expected as a result of facility demolition.

No direct adverse impacts to groundwater are expected to occur with the implementation of Alternative 2. Indirect impacts would include loss of surface area for groundwater recharge resulting from impervious surfaces. The decreased surface area is relatively small in comparison to the size of the aquifer; therefore, adverse impacts to groundwater recharge are expected to be less than significant.

The entire Task Force construction footprint is within the 100-year floodplain of the Chena and Tanana rivers, but there are no practicable alternatives to locating the Proposed Action in a floodplain. In addition, the proposed project site is protected by levees, swales, and melt channels, and is part of the Chena River Flood Control Project. The flood control project eliminates or minimizes potential risks of flood loss and lessens the impact of floods on

human safety, health, and welfare. As a result, floodplain impacts would be minor because construction and demolition activities would not result in notable floodplain alteration or changing flood elevations or flows. This complies with Executive Order (E.O.) 11988, 23 CFR 650.105(k), Army regulations, and the guidance contained in the *Federal Register* (FR), Volume 42, Page 26951 (42 FR 26951). The final finding of no practicable alternative is included in Appendix C.

Operations and Maintenance

Indirect adverse impacts to surface water resources could occur as a result of increased surface water runoff from operation of facilities under the Proposed Action. Projects constructed under Alternative 2 are expected to cover approximately 54.6 acres. Of this area, approximately 46 acres, or 84 percent, would result in impervious surfaces such as roofs, parking areas, roads, and aircraft aprons. Some of the locations where construction is proposed are currently paved; others are pervious, such as those covered by forest or grass. The new net impervious area would be approximately 36 acres, or 66 percent, of the total construction area. Proposed facilities would be constructed within the Cantonment of FWA. Topography within the cantonment area has little slope, and much of the runoff is expected to remain localized. The use of BMPs, including stabilization of sites after construction activities (e.g., revegetation) and conditions required in the SWPPP would minimize the potential for sediments and contaminants to enter nearby surface water bodies. Adverse impacts to surface water as a result of O&M activities are anticipated to be less than significant because operational activities would be controlled and in adherence with local management practices.

Many of the new project facilities would be roofed and, therefore, would generate few, if any, storm water pollutants. However, the outdoor helicopter parking and recreational and organizational vehicle parking (see Figure 2.5.b) would be uncovered and could produce the pollutants resulting in impairment of water quality in the Chena River. Leaks from the helicopters and vehicles, inadvertent spills during helicopter refueling, and tracked or wind-blown sediment could negatively impact water quality if materials were carried by storm water to downstream surface water bodies. To avoid or minimize impacts to water quality, the runoff from aircraft and vehicle parking areas would be directed to a baffled vault or similar oil trapping device to contain spilled fuels or leaking lubricants. Alternative BMPs that could be employed to remove sediment include biofiltration swales and proprietary storm water filter cartridges. Vehicle maintenance centers constructed by the project would be roofed. BMPs, such as use of drip pans to catch used oil, would be implemented. All wastewater from vehicle maintenance centers and vehicle wash areas would flow into oil-water separators (OWS) and the treated water would be directed to the sanitary sewer system. Accidental spills would be cleaned up according to USARAK Pamphlet 200-1, *Hazardous Materials and Regulated Waste Management* (see Subsection 4.5.2.2.3).

FWA will publish the *Guidance for Construction Activity Manual* in 2010 (see Subsection 3.10.3.1). The detailed erosion control measures and applicable BMPs for permanent storm water management will be implemented during construction under Alternative 2. With the implementation of BMPs listed in the manual and the SWPPP under the Storm Water Multi-Sector General Permit for Industrial Activities (MSGP) during operational activities, petroleum products, oil and grease, and sediment would be controlled and implementation of Alternative 2 would not be expected to exacerbate the water quality

degradation resulting from these pollutants in the Chena River. Adverse impacts to surface water, therefore, would be less than significant.

Contaminated substances have the potential to enter the aquifer as a result of O&M activities. BMPs implemented during O&M activities that decrease the potential for accidental spill would minimize or avoid impacts to groundwater resources. Potential impacts would also be managed by practices outlined in the SWPPP. Adverse impacts to groundwater as a result of O&M activities are anticipated to be less than significant.

FWA is continuing to operate under its expired MSGP and the SWPPP FWA prepared for permit renewal. Upon issuance of the new MSGP and the municipal separate storm sewer system (MS4) permit (see Subsection 3.10.3.1), FWA will comply with and implement the requirements of these permits, which would be considered protective of water quality in the Chena River.

4.10.2.2.4 Military Training

Under Alternative 2, helicopter activity and military training exercises would occur in cantonment and non-cantonment areas. Primary activities occurring within FWA's cantonment area are helicopter takeoffs and landings from Ladd AAF and aircraft maintenance. Helicopter training exercises, including flight O&M, would have a less-than-significant adverse impact on water resources or water quality within the cantonment area of FWA under Alternative 2. O&M activities conducted on the ground would be on constructed helicopter parking aprons or within helicopter hangars, and BMPs as discussed for O&M of facilities described above would be similar. With implementation of the installation SWPPP and standard BMPs to minimize the potential for accidental release of contaminated substances, adverse impacts to surface water and groundwater as a result of helicopter training activities are anticipated to be less than significant. Only slight, if any, changes are anticipated to water quality and/or quantity.

Aerial training operations under Alternative 2 would primarily conducted in non-cantonment areas. Helicopter flights from FWA's cantonment area to adjacent training lands would occur within existing flight corridors. Helicopter training activities would be conducted within existing airspace and would utilize existing Army training ranges (see Subsection 2.3.4).

Helicopter training within non-cantonment areas would not have an adverse effect on the quality or quantity of water resources on military lands in Alaska. Existing training ranges and facilities would be utilized for training. Adverse impacts as a result of increased training use of these facilities would be managed to prevent any increases in sedimentation in waterways, degradation of surface water or groundwater quality, or alterations to the floodplains by utilizing existing BMPs. No impacts would occur as a result of new range construction because only existing facilities would be used for training under this alternative.

4.10.2.3 Alternative 3: Combat Aviation Brigade

4.10.2.3.1 Aviation Personnel

Increased stationing of Soldiers, dependents, and civilian personnel would occur within the cantonment areas of FWA, FRA, and Eielson AFB under Alternative 3. Water use would

increase at these installations, with the greatest increase occurring at FWA, where most increased activity would occur (see Subsection 3.1.2.7.2). No increase in Soldiers is anticipated to occur on training areas as a result of aviation activities. The effects on water resources at FWA under Alternative 3 would be similar to those described for Alternative 2.

Drinking water resources at FRA are supplied from the surface waters of Ship Creek. Eielson AFB's drinking water is supplied from groundwater resources. Increases in Soldiers and dependents are not expected to have a short- or long-term adverse affect on the quality or quantity of water resources at either of these installations. Therefore, impacts to water resources would be less than significant.

4.10.2.3.2 Aviation Assets

Additional aviation assets would be stationed at FRA and Eielson AFB under Alternative 3, in addition to those under Alternative 2. The increased assets are not expected to adversely affect water resources.

4.10.2.3.3 Facilities Construction and Demolition

All new construction would occur at FWA (see Figure 2.5.c). No new construction would occur at FRA or Eielson AFB under this alternative because existing facilities at both installations are sufficient to accommodate the additional aviation personnel. Therefore, primary impacts to water resources as a result of construction and demolition would occur at FWA.

Construction and Demolition

Construction activities under Alternative 3 would result in similar impacts to water resources and water quality as those described for Alternative 2. Under Alternative 3, indirect adverse impacts to surface water resources and water quality could occur due to construction of the proposed facilities. New construction would occupy approximately 73.0 acres of FWA's cantonment area. A large proportion of the construction footprint is located within previously disturbed or modified areas. Indirect impacts would potentially include erosion and sedimentation resulting from land disturbance (disturbance of soils and vegetation during land clearing activities to support facility construction). However, vegetation clearing is expected to be minimal because the new construction is primarily sited in areas already disturbed or hardened with concrete or pavement.

No direct adverse impacts to groundwater are expected to occur with implementation of Alternative 3 at FWA. Indirect impacts would include loss of surface area for groundwater recharge resulting from impervious surfaces. The decreased surface area is relatively small in comparison to the size of the aquifer; therefore, adverse impacts to groundwater recharge are expected to be less than significant.

The entire Brigade construction footprint under Alternative 3 is within the 100-year floodplain of the Chena and Tanana rivers, but there are no practicable alternatives to locating the Proposed Action in a floodplain. In addition, the proposed project site is protected by levees, swales, and melt channels, and is part of the Chena River Flood Control Project. The flood control project eliminates or minimizes potential risks of flood loss and lessens the impact of floods on human safety, health, and welfare. As a result, floodplain impacts would be minor because construction and demolition activities would not result in

notable floodplain alteration or changing flood elevations or flows. This complies with E.O. 11988, 23 CFR 650.105(k), Army regulations, and the guidance contained in the FR, Volume 42, Page 26951 (42 FR 26951). The final finding of no practicable alternative is included in Appendix C.

Operations and Maintenance

Indirect adverse impacts to surface water resources could occur as a result of increased surface water runoff from operation of facilities under the Proposed Action. Under Alternative 3, new construction would occupy approximately 73.0 acres of FWA's cantonment area. Of this area, approximately 64 acres, or 88 percent, would result in impervious surfaces such as roofs, parking areas, roads, and aircraft aprons. Some of the locations where construction is proposed are currently paved; others are pervious, such as those covered by forest or grass. The new impervious area would be approximately 49 acres, or 67 percent, of the total construction area. Proposed facilities would be constructed within the Cantonment of FWA and the surface water impacts would be similar to those discussed in Subsection 4.10.2.2.3.

O&M activities under Alternative 3 would have impacts to water resources and water quality similar to those described for Alternative 2. FWA would employ the BMPs and requirements of permits, as discussed in Subsection 4.10.2.2.3. In addition, O&M activities would occur at FRA and Eielson AFB. Impacts to water resources would be expected to be similar, although lesser in extent, to those impacts occurring at FWA under Alternative 2. Fewer helicopters would be stationed at FRA and Eielson AFB, so the amount of O&M and its corresponding impacts would be smaller than those at FWA.

4.10.2.3.4 Military Training

Under Alternative 3, helicopter activity and military training exercises would occur within cantonment and non-cantonment areas of FWA, FRA, and Eielson AFB. Primary activities occurring within the cantonment areas are helicopter takeoffs and landings from airfields and aircraft maintenance. Helicopter training exercises, including flight O&M, would have a less-than-significant adverse impact on water resources or water quality within the cantonment areas under Alternative 3. O&M activities conducted on the ground would be on constructed helicopter parking aprons or within helicopter hangars, and BMPs as discussed for O&M of facilities described above would be similar. With implementation of the installation SWPPP, and standard BMPs to minimize the potential for accidental release of contaminated substances, adverse impacts to surface water and groundwater as a result of helicopter training activities are anticipated to be less than significant. Only slight, if any, changes are anticipated to water quality and/or quantity.

Aerial training operations under Alternative 3 would primarily conducted in non-cantonment areas. Helicopter flights from the cantonment areas to adjacent training lands would occur within existing flight corridors. Helicopter training activities would be conducted within existing airspace and would utilize existing Army training ranges (see Subsection 2.3.4).

Helicopter training within non-cantonment areas would not have an adverse effect on the quality or quantity of water resources on military lands in Alaska. Impacts would be similar to those described under Alternative 2.

4.10.2.4 Summary of Impacts

Table 4.10.b summarizes the how the alternatives would affect the significance criteria defined in Table 4.10.a. All of the expected impacts associated with each alternative are either temporary or insignificant.

TABLE 4.10.b
Comparative Summary of Impacts by Alternative for Water Resources
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Surface Water	No impact.	Less-than-significant adverse impact due to erosion and sedimentation during construction activities.	Similar to Alternative 2.
Groundwater	No impact.	Possible less-than-significant adverse impacts due to potential release of hazardous materials during construction and helicopter O&M.	Similar to Alternative 2.

4.10.3 Mitigation

Based on a comparison of alternatives and significance criteria, impacts to surface water and groundwater are expected to be less than significant as a result of the Proposed Action. Implementing existing permit requirements and associated SWPPPs and BMPs would reduce the potential for sedimentation and potential release and transport of contaminants to water resources. To protect storm water quality and to avoid further degradation of water quality in the Chena River, the Army will:

- Implement the requirements of the MGSP and MS4 permits when they are issued.
- Coordinate with ADEC and the EPA to implement additional measures, as deemed necessary, to address issuance of a total maximum daily load limit for the Chena River (anticipated in 2010).

FWA is located within the Chena River Lakes Flood Control Project which eliminates or minimizes potential risks of flood loss and lessens the impact of floods on human safety, health, and welfare. As a result, floodplain impacts (i.e., construction within the Chena River floodplain) would be minor because construction and demolition activities would not result in notable floodplain alteration or changing flood elevations or flows.

4.11 Subsistence and Recreation

This section presents the environmental analysis of potential impacts to subsistence and recreation, including public access, as a result of implementing any of the alternatives.

4.11.1 Significance Criteria

The analysis of impacts on subsistence was based on a review of readily available existing data, planning documents, and professional opinion. No original data collection was undertaken as part of this EIS.

All direct and indirect impacts to subsistence were considered qualitatively. It was assumed the presence of additional personnel, dependents, and civilians and training activities are the proposed activities that have the most potential to impact subsistence and recreation, including public access.

The evaluation criteria for subsistence and recreation (described in Section 3.11) are the basis of the significance criteria used to assess the potential impacts of the Proposed Action alternatives compared with the No Action alternative. Subsection 4.11.2.4 provides an analysis of alternatives compared to the significance criteria shown in Table 4.11.a.

TABLE 4.11.a
Subsistence and Recreation Significance Criteria
USARAK Aviation EIS

Topic	Criterion
Subsistence	Activities that would substantially change rural access to area federal lands during times of seasonal subsistence activities.
	Activities that would substantially reduce reasonably accessible subsistence resources.
Recreation	Activities that would substantially limit access to recreational areas during summer and fall.
	Activities that would result in substantial negative impacts to recreational resources, such as campgrounds, recreational trails, and road-accessible water bodies.
	Direct or indirect impact to recreation, including access, that would have a measurable effect, such as reduction in access, alteration of recreation opportunities, or change in activity location.

4.11.2 Environmental Consequences for Subsistence and Recreation

Potential impacts to subsistence and recreation resources include reduced access to resources, through either temporal or spacial availability, or increased pressure on or use of resources.

The Army is responsible for managing its lands to meet the primary military mission, including readiness. USARAK affects subsistence and recreation, including reduced access and increased pressure on existing resources, through the following means (USARAK, 2004a):

- Temporal Availability: The Army may decide how often, or for how long, its lands are available for public access.
- Spatial Availability: To meet mission goals and to protect human health and safety, USARAK must keep certain lands or areas off-limits to public access. This can be temporary or permanent, such as dedicated IAs and some ranges.

- Subsistence or Recreation Availability: To protect and sustain Army lands, wildlife populations, or human health, the Army may alter the types or frequency of subsistence and recreation activities allowed on its properties.

The Brigade and Task Force would be stationed primarily at the FWA Main Post, with the remaining Soldiers and aircraft stationed at the FRA and Eielson AFB cantonment areas. Training activities would be spread out among FRA, FWA, and DTA range lands.

4.11.2.1 Alternative 1: No Action

4.11.2.1.1 Aviation Personnel

Under the No Action alternative, no increase in Soldiers, dependents, or civilian personnel would occur. No change in current subsistence and recreation would occur as a result of the Proposed Action, and no impact would occur.

4.11.2.1.2 Aviation Assets

Under the No Action alternative, no increase in aviation assets (helicopters, vehicles, generators) would occur. The impacts to subsistence and recreation would not change from existing conditions, and no impact would result due to implementation of the No Action alternative.

4.11.2.1.3 Facilities Construction and Demolition

Construction

Under the No Action alternative, temporary impacts would result from construction projects already scheduled to take place. No adverse short- or long-term effects to subsistence and recreation would result due to implementation of the Proposed Action.

Operations and Maintenance

O&M at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no adverse short- or long-term adverse effects to subsistence and recreation would occur due to implementation of the Proposed Action.

4.11.2.1.4 Military Training

Cantonment

Helicopter training exercises at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no short- or long-term effects to subsistence and recreation would occur to cantonment areas due to implementation of the Proposed Action.

Non-Cantonment

Helicopter training exercises at all installations would continue as currently conducted for existing USARAK aviation units. Under the No Action alternative, no adverse short- or long-term effects to subsistence and recreation would occur to non-cantonment areas due to implementation of the Proposed Action.

4.11.2.2 Alternative 2: Aviation Task Force

4.11.2.2.1 Aviation Personnel

Increased numbers of aviation personnel (Soldiers, dependents, and civilian personnel) would be present within the cantonment areas of FWA with implementation of Alternative 2. Additionally, Soldiers, dependents, and civilian personnel would have access to the areas where subsistence and outdoor recreation activities occur at FWA, including YTA, TFTA, and DTA; FRA; and Eielson AFB.

While the Soldiers, dependents, and civilian personnel living in or near Army installations do not qualify for subsistence preference, they are likely to engage in many of the same subsistence activities (berry and plant product gathering, and fishing) as practiced by the rural populations. Given the amount of regional federal land and the relative small increase in population, the additional aviation personnel would have a minor, but not significant, adverse, impact on subsistence resources.

The additional Soldiers, dependents, and civilian personnel can be expected to participate in outdoor recreation activities at FWA, including YTA, TFTA, and DTA; FRA; and Eielson AFB. Because of the relatively small numbers of additional Army personnel, the additional pressure on recreational resources would be minor. Because the additional Soldiers do qualify for State hunting permits, this would increase competition for the more popular hunting areas and permits, although the relative increase would be minor. Therefore, additional Army personnel would have a minor, but not significant, adverse impact on recreational resources.

4.11.2.2.2 Aviation Assets

Increased aviation assets (helicopters, vehicles, generators) would be stationed at FWA and used at USARAK training areas with implementation of Alternative 2. It is anticipated that the increased aviation assets would result in no impact to subsistence or recreation resources.

4.11.2.2.3 Facilities Construction and Demolition

All new construction would occur at FWA (see Figure 2.5.b) within the cantonment area. No new construction would occur at FRA, at Eielson AFB, or on training lands. New and, in some cases, renovated buildings would be required at FWA to support the Soldiers and helicopters needed to conduct integrated aviation training under Alternative 2. Because subsistence and outdoor recreation resources are not located within the FWA Cantonment, no direct or indirect impact to subsistence or recreation would occur due to implementation of Alternative 2.

4.11.2.2.4 Military Training

No impact on subsistence and outdoor recreation activities would occur within the cantonment areas of FWA, FRA, and Eielson AFB under Alternative 2 because subsistence and outdoor recreation do not occur in the cantonment areas.

Training exercises that result in road closures in the field training areas could result in adverse, but not significant, impacts to subsistence and recreation activities. A reduction in both temporal and spatial access to subsistence and recreation resources is anticipated;

closures would be due primarily to military training exercises, and would include subsistence and recreational use closure, or seasonal closures, on those properties that could result in a possible increased risk of accidental injury.

The locations where training would occur (e.g., FWA, outside of the Cantonment, including TFTA, YTA, and DTA) have multiple access routes to, through, and adjacent to the facilities. Although not all access would be of the same type or amount, lands adjacent to the training facilities would continue to be available for subsistence and recreation activities when USARAK lands are unavailable or closed.

4.11.2.3 Alternative 3: Combat Aviation Brigade

4.11.2.3.1 Aviation Personnel

With the additional stationing of Soldiers at Eielson AFB, an increase in Soldiers, dependents, and civilian personnel under Alternative 3 would have impacts to recreation resources similar to, although slightly greater than, those described for Alternative 2. As with Alternative 2, adverse, but not significant, impacts to subsistence would occur due to implementation of Alternative 3.

4.11.2.3.2 Aviation Assets

Additional aviations assets would be stationed at FRA and Eielson AFB under Alternative 3, in addition to those added under Alternative 2. As with Alternative 2, the increased assets would result in no affect to subsistence and recreation resources.

4.11.2.3.3 Facilities Construction and Demolition

All new construction would occur at FWA (see Figure 2.5.c) within the cantonment area. No new construction would occur at FRA, Eielson AFB, or on training lands. New and, in some cases, renovated buildings would be required at FWA to support the Soldiers and helicopters needed to conduct integrated aviation training under Alternative 3. Because subsistence and outdoor recreation resources are not located within the FWA Cantonment, no direct or indirect impact to subsistence or recreation would occur due to implementation of Alternative 3.

4.11.2.3.4 Military Training

No impact on subsistence and outdoor recreation activities would occur within the cantonment areas of FWA, FRA, and Eielson AFB under Alternative 3 because subsistence and outdoor recreation do not occur in the cantonment areas.

Training exercises that result in road closures in the field training areas could result in adverse impacts to subsistence and recreation activities. A reduction in both temporal and spatial access to subsistence and recreation resources is anticipated; closures would be due primarily to military training exercises, and would include subsistence and recreational use closure, or seasonal closures, on those properties that could result in a possible increased risk of accidental injury.

The locations where training would occur (e.g., FWA, outside of the Cantonment, including TFTA, YTA, and DTA; FRA; and Eielson AFB) have multiple access routes to, through, and adjacent to the facilities. Although not all access would be of the same type or amount, lands

adjacent to the training facilities would continue to be available for subsistence and recreation activities when USARAK lands are unavailable or closed. Therefore, implementation of Alternative 3 would result in adverse, but not significant, impacts to subsistence and recreation

4.11.2.4 Summary of Impacts

Table 4.11.b presents a comparative summary of how the alternatives would affect the significance criteria defined in Table 4.11.a. Adverse, but not significant, impacts are anticipated to occur under the Proposed Action alternatives as a result of a relatively minor increase in the area population and reduced availability of USARAK training lands for subsistence and recreation.

TABLE 4.11.b
Comparative Summary of Impacts by Alternative for Subsistence and Recreation
USARAK Aviation EIS

Topic	Alternative 1 No Action	Alternative 2 Aviation Task Force	Alternative 3 Combat Aviation Brigade
Subsistence	No increased impact to subsistence use of USARAK lands.	Less than significant adverse impact to access for subsistence use of USARAK lands is expected to occur as a result of increase military training.	Greater adverse impact than Alternative 2 because of the greater frequency of USARAK land closure expected in order to accommodate the increased military training, but still less than significant impact.
Recreation	No increased impact to recreational use of USARAK lands.	Less than significant adverse impact to access for subsistence use of USARAK lands is expected to occur as a result of increase military training.	Greater adverse impact than Alternative 2 because of the greater frequency of USARAK land closure expected in order to accommodate the increased military training, but still less than significant impact.

4.11.3 Mitigation

Implementation of the Proposed Action would result in adverse, but not significant, impacts to subsistence and recreation. This finding, as it relates to subsistence, is consistent with the Bureau of Land Management (BLM) 1986 study in which the BLM determined that Army activities, including construction and training activities, on public lands have not had a significant effect on subsistence use of these lands (USARAK, 1999). The conclusions reached in these studies remain valid and form a baseline for this review. Additionally, the analysis conducted for the *Final EIS for the Construction and the Operation of a Battle Area Complex and Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska* (USARAK, 2006a) resulted in the conclusions that environmental consequences to subsistence would be minor. Finally, the overall impact of Army Transformation on subsistence on Army lands in Alaska was determined to be minor (USARAK, 2004a).

BMPs currently in place to address subsistence and recreation resources will minimize the effects of reduced temporal and spatial availability for subsistence and outdoor recreation due to increased training activities. Additionally, BMPs will minimize the effects of

increased recreation pressure due to the presence of additional Soldiers, dependents, and civilian personnel.

The Army is implementing and will continue to implement the following BMPs to reduce environmental effects on subsistence:

- Ensure existence of full-time Native Tribal coordination within USARAK.
- The Sikes Act requires military lands be made available for nonmilitary uses when it does not impact military training and is not a hazard to public safety.
- Continue compliance with regulations listed under the Alaska National Interest Lands Conservation Act (ANILCA).
- Follow regulations listed under ANILCA. Working with relevant federal and State officials to protect local subsistence populations through priority for harvest when resources are reduced will protect the viability of subsistence in the area
- Initiate research and cooperative studies with Alaska Native Tribes to address possible effects of Army activities on subsistence resources both directly within USARAK installation boundaries and on those outlying resources that may also be affected by Army activities.
- Continue establishment of government-to-government relationships with Alaska Native Tribes.
- Consult with all interested parties, especially Alaska Native Tribes and rural dwellers, to determine subsistence need and subsistence areas. This will identify USARAK lands potentially or historically used for subsistence harvest
- Ensure through tribal consultation and use of a newsletter that subsistence users are aware of, and provided opportunity to comment on, existing hunting and fishing programs on USARAK lands.
- Work with relevant federal and State officials to protect local subsistence populations through priority for harvest when resources are reduced to protect the viability of subsistence in the area.
- Implement an education and awareness program for military personnel and others applying for hunting and fishing permits on USARAK lands to emphasize the importance of subsistence resources to rural dwellers and to discourage the waste of any subsistence resource.
- Continue implementation of *Integrated Natural Resources Management Plans* (INRMPs), USARAK natural resources conservation programs, and ecosystem management.
- Continue with ongoing soil and water quality monitoring to trace the fate of munitions constituents as described in INRMPs. This will be done to address concerns of contamination to subsistence resources.

Additionally, the Army is implementing and will continue to implement the following BMPs to reduce environmental effects on recreation resources:

- Implement the *Range and Training Land Development Plan*, *Integrated Training Area Management (ITAM) Work Plan*, Environmental Management Systems, the INRMP, *Integrated Cultural Resources Management Plan*, ecosystem management program, and sustainable range program.
- Determine placement of access gates to allow for maximum continued recreational use and maximum public safety.
- Maintain access to ADF&G-stocked lakes.
- Allow recreational activities outside of the construction footprint and maneuver area per current USAG-AK management policies.
- Ensure that members of local communities, who may not have access to the Internet are kept informed about USARAK policies and activities.
- Provide up-to-date information to members of local communities that may be affected by activities on USARAK lands.
- Continue to provide environmental awareness training to troops and civilians.
- Continue to develop and implement an information and education program for Army and civilian personnel using USARAK lands.
- Notify public about range use, duration of exercise/range closure, and any use of close air support.
- Publish a public notice of major training exercises throughout the Delta Junction community and in the local newspaper at least 2 weeks prior to the training event.
- Provide educational opportunities on USARAK lands.
- Work with ADF&G to support stocked lake program brochures, signs, and improvements.
- Monitor recreational impacts on stocked lakes and streams, and upgrade access and recreational opportunities when needed. Improved monitoring of, and access to, stocked lakes will allow USARAK and ADF&G to better manage the stocked lakes program on Army lands.
- Build and maintain kiosks at all primary entrances to recreational areas on USARAK lands, and provide visitors maps and information geared towards that area. Information kiosks can assist users to quickly identify areas designated for recreational use, as well as the times and locations of military activities.
- Develop a public information packet and media strategy to inform the public of restricted-access areas and areas open for public use. The information packet will contain a map identifying restricted and open areas, roads, authorized activities, restricted air space, and information on airspace accessibility. USARAK will study the feasibility of establishing an Internet website and telephone hotline to provide access information.

- Continue or increase hunter safety education courses and work with ADF&G to provide educational opportunities on USARAK lands. Hunter safety courses and educational opportunities will allow USARAK to better and more safely manage its lands for a wide range of public uses.
- Fully fund conservation officers to enforce State and federal game laws and military rules and restrictions.
- Continue to implement INRMPs.
- Continue to implement ITAM Work Plan.
- Monitor recreational usage of each training area through the U.S. Army Recreational Tracking (USARTRAK) phone system. This will inform USARAK and ADF&G regarding use patterns, which should improve management for public access and recreation.
- Federal, State, and military regulations govern recreational use of withdrawn lands, and such regulations recognize environmental needs. Recreational activities are monitored throughout the INRMP.
- Expand public notification of imminent convoy activity.
- Make USARAK long-term training and convoy schedules available to the public.
- Continue to streamline public access to USARAK lands through the Recreational Access Permit (RAP).
- Maintain the extended 2-year renewal duration on the FWA and DTA RAPs. A 2-year permit duration will simplify public access to USARAK lands.
- Continue to implement *Range Development Plan*, involving maintenance projects on all firing ranges such as target repair and replacement, target mechanism maintenance and repair, and maintenance of range buildings.
- Conduct a detailed study to assess the impacts of recreational vehicles on USARAK lands. This will support USARAK long-term management plans.
- Continue to implement recreational vehicle use policies in accordance with the most recent INRMPs. The INRMPs lay out specific actions to maintain and improve public access and recreation opportunities on USARAK lands.
- Upgrade access and recreational opportunities when needed.
- Upgrade road access at Fleet Street, if determined to be a viable method to facilitate public access.
- Continue to implement USARTRAK automated check-in phone system. This will provide information regarding daily closures, and should greatly simplify the public access process.

- Monitor recreational usage of each training area through the USARTRAK phone system. This will inform USARAK and ADF&G about use patterns, which should help to improve management for public access and recreation.

With ongoing implementation of standard BMPs established by USARAK for subsistence and recreation activities, the overall impact to this resource is adverse, but not significant, and no mitigation is required.

4.12 Cumulative Effects Analysis

This section of the EIS analyzes potential cumulative impacts associated with the Proposed Action in the context of other past, present, and reasonably foreseeable actions in the FWA, FRA, and Eielson AFB regions. The analysis presented here supplements the broad analysis of cumulative effects of Army actions on USARAK lands conducted for the *Final Environmental Impact Statement for Transformation of the U.S. Army Alaska, Volumes 1 and 2* (USARAK, 2004).

The Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1508.7) define a "cumulative impact" for purposes of NEPA as follows:

> *Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Cumulative impacts would occur if incremental impacts of the Proposed Action, added to the environmental impacts of past, present, and reasonably foreseeable similar actions, would result in an adverse effect to resources in the region of influence (ROI) for FWA, FRA, and Eielson AFB. In consideration of actions to include in the cumulative impacts assessment in this EIS, actions that have the potential to combine with incremental effects of the Proposed Action to result in cumulative impacts are those that:

- Are of a similar character, could affect environmental resources similar to those of the FWA, FRA, or Eielson AFB, or are located in close geographic proximity to the increased aviation assets; and
- Have occurred, are ongoing, or are reasonably foreseeable; reasonably foreseeable actions are those that have an application for operations pending before an agency with permit authority and would occur in the same timeframe as the Proposed Action and alternatives.

The Army has developed a *Cumulative Effects Analysis Guidance Manual* (May 2006) to support Army NEPA analysis and documentation. The guidance, which is rooted in CEQ guidance (1997) for cumulative impact assessment, outlines a systematic approach for assessing cumulative impacts that includes scoping the important issues and actions, characterizing the existing environment, and determining environmental consequences.

4.12.1 Approach for Assessing Cumulative Effects

To determine whether resources would be sensitive to cumulative effects, thereby warranting a cumulative impact assessment, the EIS analysis followed the Army's (and CEQ's) 11-step process to assess potential cumulative effects:

Step 1. Identify significant cumulative issues associated with the Proposed Action

Step 2. Establish geographic scope for analysis

Step 3. Establish a timeframe for the analysis

Step 4. Identify other actions affecting VECs of concern

Step 5. Characterize the sensitivity of VECs

Step 6. Characterize the stresses on the VECs

Step 7. Define a baseline condition for the VECs

Step 8. Identify cause-effect relationships between human activities and VECs

Step 9. Determine magnitude and significance of cumulative effects

Step 10. Modify actions to minimize significant cumulative effects

Step 11. Monitor cumulative effects during project implementation

The Army uses three levels of effects analysis to accomplish these steps and evaluate VECs or resources. The foundation of this methodology is Quick Look Questions (USAEC, 2007a). The Quick Look Questions, which have been adapted by USARAK to be more reflective of the Alaskan environment, are used to determine the need to address the direct and indirect effects of a Proposed Action on each VEC. The Quick Look Questions help screen VECs by answering resource-specific questions learned through the NEPA process related to scoping concerns raised, affected environment, and environmental consequences. Depending on the outcome of the Quick Look analysis, three levels of cumulative impact analysis are recommended:

- No further analysis is needed if the answers to the Quick Look Questions show significant impacts are not likely.
- Analysis and discussion are required if the Quick Look Questions cannot be easily answered.
- Detailed analysis is required if potentially significant impacts could occur.

4.12.2 Cumulative Impact Assessment

The format of this subsection is organized by resource. As described above, the Quick Look method of questions listed in the *NEPA Analysis Guidance Manual, Quick Look Guide* was used to determine which resources would be analyzed in detail for potential cumulative effects. The Quick Look Questions and responses are included in Appendix E.

The resources listed in Table 4.12.a were not analyzed in detail based on the results of the Quick Look Questions.

TABLE 4.12.a
Resources Considered but not Analyzed in Detail According to Quick Look Questions
USARAK Aviation EIS

Resource	Quick Look Table in Appendix E	Summary
Air Quality	Table E-10	The Proposed Action alternatives have demonstrated general conformity and would not contribute to violation of NAAQS. Other regional actions that could contribute to violations of NAAQS also are independently reviewed for conformity. The FNSB and ADEC will be implementing emission monitoring, a future vehicle emission testing study for $PM_{2.5}$, and other measures to achieve attainment of $PM_{2.5}$. An attainment demonstration plan will be developed to define these measures.
Soils and Permafrost	Table E-12	Construction of facilities within the FWA Cantonment will have a minimal effect on soils and permafrost because the construction areas already are largely urbanized. Disturbance of soils or permafrost during construction can be managed effectively with standard BMPs.
Socioeconomics (except Army housing)	Table E-11	Minority and low-income populations are either not affected or not disproportionately affected by the Proposed Action. Population growth would not exceed historic increases successfully absorbed by the surrounding communities. Local schools have sufficient capacity to absorb the additional students from military families and Federal impact aid will offset additional costs to the school districts.
Water Resources	Table E-13	No long-term adverse impacts to water resources are anticipated. Compliance with storm water discharge permits (and associated SWPPPs, and BMPs) during construction and operation will prevent pollutant discharges into the Chena River. Because all new development (including that by others) must include measures for water protection or treatment, or both, degradation of water quality in the impaired section of the Chena River would be halted or improved.
Traffic/Transportation Systems	Table E-2	No long-term adverse impacts to traffic and transportation systems are anticipated. Traffic plans are up to date, existing roads can support increased traffic associated with the Proposed Action, and significant population growth outside the military installations is not anticipated.
Vegetation	Table E-9	Construction in the FWA Cantonment would not affect vegetation because construction sites have. Training activities would have limited effect on wetlands because most of the training would be aerial and not ground-based. Combined training would have limited effect on wetlands because of restrictions on the seasons of training over wetlands.
Wetlands	Table E-9	Construction in the FWA Cantonment would not affect wetlands because wetlands can be avoided. Training activities would have limited effect on wetlands because most of the training would be aerial and not ground-based. Combined training would have limited effect on wetlands because of restrictions on the seasons of training over wetlands.
Fire Management	Table E-3	The potential for fire impacts associated with the increased military personnel and training intensity is very low. New projects to reduce fire risks from fuels are being studied and planned. The application of ongoing mitigation and avoidance measures has proven effective for wildland fire management.
Land Use/Energy/ Utilities	Table E-4	No changes to land use, energy, or utilities are expected from the Proposed Action.

The resources analyzed for potential cumulative effects include Airspace Management; Cultural Resources; Hazardous Materials/Hazardous Waste; Noise; Wildlife and Fisheries; and Public Access, Recreation, and Subsistence. The basis for including these VECs in the cumulative impact analysis is summarized in Table 4.12.b.

TABLE 4.12.b
Basis for Valued Environmental Component Inclusion in the Cumulative Impact Analysis
USARAK Aviation EIS

Resource	Raised in Scoping?	Sensitivity of Resource?	Impacts Associated with Alternatives 2 and 3?	Other Actions Affecting Resource?	Quick Look Suggested Analyses?	Geographic Scope of Analysis
Airspace Management	Yes	High	Yes	Yes	Yes	Airspace around USARAK installations and training areas
Cultural and Visual Resources	Yes	High	Yes	Yes	Yes	FWA
Hazardous Materials/ Hazardous Waste	Yes	High	Yes	Yes	Yes	FWA
Noise	Yes	High	Yes	Yes	Yes	Noise contours around flight corridors, USARAK installations, and training areas
Wildlife and Fisheries	Yes	High	Yes	Yes	Yes	Flight corridors and USARAK training areas
Socioeconomics-Army housing	Yes	Medium	Yes	Yes	Yes	FNSB and Anchorage MSA
Public Access, Recreation, and Subsistence	Yes	Medium	Yes	Yes	Yes	Flight corridors and USARAK training areas

4.12.3 Other Past, Present, and Reasonably Foreseeable Future Actions

The geographic scope for the cumulative analysis is reflected in Table 4.12.a. Construction and operations actions on USARAK lands were reviewed and determined to be relevant to assessment of potential impacts to cultural resources; hazardous materials/hazardous wastes; wildlife and fisheries; noise; public access, recreation, and subsistence. Construction and operation of facilities at FWA near the NHL and Cold War historic district have the potential to affect historic resources cumulatively and these resources are sensitive to cumulative effects because of past actions that have diminished historic integrity. Airspace has a broad geographic area because Army, USAF, and civilian actions throughout Alaska aviation are critically important to both military and non-military functions. The impacts of past military and non-military actions on these VECs were thoroughly analyzed in the *Final Environmental Impact Statement for Transformation of the U.S. Army Alaska, Volumes 1 and 2* (USARAK, 2004a) and are incorporated into this analysis.

Based on the VECs analyzed and the geographic scope of those VECs, the following present actions were determined to be relevant to cumulative impact analysis:

- Construction and revitalization of family housing on FWA, under two programs. An EA (USARAK, 2004b) was prepared for military construction (MILCON) of 400 new units. Approximately half of those are complete with the remainder under construction and

anticipated for completion by 2010. This action involves disturbance of approximately 280 acres and includes demolition of outdated housing and other facilities for building sites. In addition, during the 5-year RCI *Initial Development Plan* (2009 to 2014), the privatized housing partnership (North Haven Communities) plans to construct 524 new units, demolish 685 older units, revitalize 321 units, and construct a new Community Center/Welcome Center. New construction will generally be limited to areas that currently have housing units, with some undeveloped land being used temporarily for construction laydown and staging. This action was evaluated in the EA, *Implementation of the Army Residential Communities Initiative at Fort Wainwright, Alaska* (USACE, 2008).

- Ongoing construction at FRA to support the Airborne Brigade Combat Team (ABCT). An EA, *Conversion of the Airborne BCT* (USARAK, 2005), was prepared for this action, which involves construction of approximately 770,000 square feet of new facilities.
- Continued routine military operations, including training and deployments, of units stationed presently at FWA, FRA, and Eielson AFB. Continued training includes combined air- and ground-based training exercises, which were envisioned and analyzed as Alternative 4 in the USARAK Transformation EIS (USARAK, 2004a).
- Construction and operation of the Battle Area Complex (BAX)/Combined-Arms Collective Training Facility (CACTF). An EIS was prepared to evaluate the impacts of the construction and operation of the BAX/CACTF. The construction of these facilities will be completed in FY 2010 and operation will begin following completion of construction (USARAK, 2006a).
- Construction of facilities, beddown, and training to support new C-17s and F-22As at Elmendorf AFB in Anchorage. EAs were prepared, and the actions are under way (CH2M HILL, 2004; Elmendorf AFB, 2006).
- Relocation of the Air National Guard 176th Wing to Elmendorf AFB, Alaska. An EA was prepared to assess effects, and the action is under way. The EA concluded that there would be "no discernible impact to airspace management" from the action, and no construction would be required outside of Elmendorf AFB. Because this action would not affect airspace or require any construction on FWA Main Post, this action does not have potential to create cumulative effects and is not analyzed in this EIS.
- Base Realignment and Closure (BRAC) Actions at Eielson AFB, Elmendorf AFB, and FRA consolidating aircraft fleet and shifting installation management functions. Actions also include introduction of three C-27J Spartan aircraft to Elmendorf AFB. Environmental review was completed and actions are being phased.
- Grow the Army initiative of stationing an additional 1,773 Soldiers at FRA and an additional 425 Soldiers at FWA and associated construction (USARAK, 2008). An EIS and an EA have been prepared to assess effects.
- Army National Guard Transformation equipment fielding, adding, and replacing aircraft used at Elmendorf AFB. An EA has been prepared to assess effects (National Guard Bureau, 2008).

- USAF proposal to add temporary MOA for Delta area. An EA has been completed (USAF, 2008).
- The Northern Rail Extension from North Pole south to Delta. Alignment roughly parallels the Tanana River and intersects Eielson AFB and DTA training areas, terminating south of FWA and its training areas. An EIS has been prepared for this action (Surface Transportation Board [STB], 2008).
- Natural gas pipeline projects through Fairbanks are proposed by private interests. An EIS is under way for the Beluga-to-Fairbanks pipeline. A State license for the construction of a natural gas pipeline between the North Slope and markets in Alberta, Canada and the lower 48 states was awarded in December 2008 to TransCanada Corp. The pipeline route would go through Fairbanks and Anchorage. An EIS will be required but has not been initiated. Because the environmental review of these projects is very preliminary, specific details on the actions have not been developed, and final application to construct the projects cannot occur until the NEPA processes are complete. These projects are not reasonably foreseeable from a NEPA perspective. Construction of the projects could have major effects on soils and permafrost, socioeconomics, wildlife migration, wetlands, air quality, hazardous materials management, and other VECs. How those effects might interact with the Proposed Action or what mitigations might be included in the pipeline proposals are not known. These projects, therefore, are not considered in this cumulative analysis.

4.12.4 Cumulative Impact Assessment

The following sections provide analysis of the cumulative effects of the Proposed Action when added to other Army and non-Army actions occurring within the geographic scope of the resource. Cumulative impact assessment was determined important for VECs that were determined to be potentially vulnerable to cumulative effects because the Proposed Action had an important effect on the VEC or the VEC was sensitive to cumulative effects because it has been stressed by previous actions.

4.12.4.1 Airspace Management

Air travel in Alaska is a central component of transportation. With a limited roadway network and vast land area, air travel is often the most efficient, and in many cases only, method of transporting people and goods. As described in Section 4.2, USARAK helicopters operating outside of installation boundaries use Alaska airspace that is also used by civil aviation, and interaction with other airspace users could occur in much of the airspace used by USARAK helicopters, even those areas that are designated as special use airspace. As discussed in Subsection 4.2.2.4, however, interaction of USARAK helicopter and civil aircraft users is not common. The EIS also has clarified that the Proposed Action does not involve any changes to airspace designation, only additional use of existing airspace. Because of the importance of air travel in Alaska and the interaction of civil and military aircraft, continued access to airspace and concerns about airspace congestion were the most frequently raised comments during the scoping for this EIS.

The other actions relevant to cumulative impact analysis for airspace management include:

- BRAC Stationing Actions
- Grow the Army (USARAK, 2008)
- Beddown of F-22s at Elmendorf AFB
- Beddown of C-17s at Elmendorf AFB
- Relocation of the Air National Guard 176th Wing
- Continued military training
- Delta temporary military operation airspace (TMOA)

These projects, along with the Proposed Action, affect the use of Alaskan airspace and have the potential to cumulatively increase congestion of existing routes.

Grow the Army would not increase use of airspace or restrict civilian use of airspace (USARAK, 2008). The Grow the Army action involves units of ground-based Soldiers and does not include new aircraft or activities that would serve to increase or alter existing air operations or flight patterns.

BRAC actions affect aircraft basing and facilities at Elmendorf and Eielson AFBs and affect airspace use throughout Alaska. Under BRAC, the USAF is directed to consolidate aircraft fleets and relocate aircraft and squadrons, resulting in the relocation of aircraft and personnel from Elmendorf AFB to areas outside of Alaska, as summarized in Table 4.12.a. Under BRAC actions, Eielson AFB will lose 2,821 military personnel and 391 civilians. Elmendorf AFB will gain 1,102 military and 168 civilians. The gains at Elmendorf AFB are attributed to the relocation of the 176th Wing of the Air National Guard from Kulis Air National Guard Base and four C-130 aircraft from Dyess AFB in Texas. The net loss in aircraft and personnel will decrease airspace activity for the MOAs where these units operate.

The beddown of the F-22A involves stationing two F-22A operational squadrons at Elmendorf AFB. In total, 36 primary aircraft and four backup aircraft would be located at and conduct training exercises from Elmendorf AFB. The beddown has a minimal positive effect on airspace because the F-22A aircraft use the same airspace used for F-15C and F-15E aircraft, F-22A aircraft typically fly at higher altitudes than the F-15C and F-15E aircraft they are replacing, and F-22As use military training routes (MTRs) less than one-half the frequency of F-15Es (most of the F-15 aircraft were relocated to bases outside of Alaska under BRAC). For these reasons, the beddown of the F-22A proposal results in a net reduction in the potential for conflict with civil aircraft or Army helicopters that generally operate at lower altitudes.

The beddown of the C-17s involves the stationing eight C-17 aircraft at Elmendorf AFB (which replace the C-130s) and supporting training activities for these aircraft. Training activities include the airdrop of supplies, heavy equipment, and personnel, and involve 2,600 to 2,900 aircraft flying hours per year. Most training would occur at Allen AAF, which is adjacent to the DTA, but C-17s would travel throughout Alaskan airspace. No adverse impacts to Alaskan airspace were identified from the beddown or training of C-17s at Elmendorf AFB. There would be no change from existing airspace use in the Anchorage Bowl or FRA. The training area for the C-17 encompasses a geographic area of well over

3.5 million acres but it is not anticipated that there would be significant modifications to and/or increased use of the existing MTRs or MOAs.

Systems are in place to manage airspace in Alaska for all users. The systems or coordination used by the military include participation in the NOTAM, ACMAC meetings, and the USAF SUAIS program. Army participation in the NOTAM and ACMAC programs would continue under all the action alternatives. The Army will continue to advise airspace users over FREQ (FM) 38.30 regarding operational ranges and areas to avoid. The Army is currently evaluating its participation in the SUAIS program (see Subsection 3.2.1.1). Flight operations by USARAK and the USAF will continue to be governed by existing policies, regulations, and SOPs. No change to these operations would occur under the action alternatives. Despite these systems, several scoping comments from civil aircraft users and organizations suggested that the current airspace management in Alaska is not well coordinated among the Army, USAF, civil air carriers, and civil air users, and that more coordination was needed before airspace was expanded. Others pointed to inadequate communication systems and encouraged the Army to consider improving communication before making any changes in airspace. USARAK does acknowledge concerns about airspace and will continue to work with other airspace users to ensure airspace is managed to provide safe access for all users.

Because none of these Army, USAF, or Air National Guard proposals change or expand airspace designations, there is no impact from expanding airspace. The military proposals for use of Alaskan airspace may actually decrease congestion of the low-altitude airspace that is shared between military and civil users, resulting in a minimal positive cumulative effect from military actions in Alaskan airspace. The decrease would occur because of relocation of flying missions outside of Alaska, and changes to USAF squadrons that use aircraft operations at higher altitudes. Although no specific civil proposals for changing or expanding use of Alaskan airspace were identified, it is assumed that civil airspace use will continue and increase in relation to future, unspecified land and community development, and this civil use would not be adversely affected by military actions.

The USAF proposes to make the Delta TMOA permanent. The TMOA would be active during limited days and hours of the year. The USAF has concluded that the additional airspace restrictions would have only a minor impact to civilian aircraft operations. Public comments, however, suggest that this additional restriction could impact non-military uses, including emergency services. Public concerns regarding the Delta TMOA would continue, and the limited restriction on airspace could pose a problem for civilian or military operations within the airspace during certain times of the day and certain days each year. The USAF has committed to providing advance notice of airspace restrictions, coordination of training activities with emergency service providers, and allowing VFR operations to continue unchanged. Because it does affect VFR corridors, the Delta TMOA could also affect USARAK's operations at lower altitudes.

There would be little cumulative impact to use of Alaskan airspace. Although actions, including the Proposed Action, would increase use of airspace, few involve use of VFR corridors where conflicts with GA would be more likely. The USAF and Army actions involve aircraft flying at different altitudes and, therefore, do not contribute to cumulative congestion. The only action that has potential to limit airspace is the Delta TMOA, which is being analyzed by the USAF. Overall, the cumulative actions would not significantly affect

airspace safety, predictability, or accessibility, and cumulative impacts would be less than significant.

4.12.4.2 Cultural and Visual Resources

Military development in Alaska during World War II and the Cold War is central to Alaska's modern history, and Alaska's vast land and airspaces continue to provide unique opportunities for military training and mission operations. Military threats, however, have continued to change. As the Army and USAF missions evolved to meet current threats and requirements, much of the early infrastructure became outdated or obsolete as well as difficult and expensive to maintain. The Army and USAF demolished many of the physical remnants of the World War II and Cold War eras despite their significance to Alaskan and, in some cases, national history. The cumulative loss of resources places more importance on those that remain and retain historical integrity.

Military training has also disturbed land areas that could have been home to important archaeological resources. Archaeological resources destroyed by military training cannot be recovered. Current military training, however, provides a process by which to protect yet unidentified archaeological resources from damage. Before training extends into new, undisturbed areas, a review is conducted of archaeological resource potential. Known archaeological resources are protected by restricting training around these resources.

Both USARAK and USAF actions that have the potential to affect important historic or archaeological resources are evaluated in compliance with Section 106 of the NHPA to determine if adverse effects could occur to those resources. Before any action is taken that could adversely affect important cultural resources, the Alaska SHPO is consulted and appropriate mitigation is identified and implemented. Because these procedures are in place, cumulative effects to resources resulting from future actions are evaluated and considered before action is taken.

As noted in Section 4.3, Cultural and Visual Resources, both of the action alternatives result in impacts to historic properties associated with the World War II and Cold War eras at FWA. New hangars would be out of scale to the remaining historic buildings and the NHL. Demolition of three buildings is expected; however, this demolition would not result in any direct or adverse impacts to any historic structures or districts.

Currently, the NHL district includes 30 properties that contribute to its significance. Although the overall historical integrity of the NHL remains intact, there have been changes over time. Several WWII-era buildings have new siding, roofs, doors, and windows. The changes to the doors and windows on the permanent buildings, such as the hangars, reflect the patterning of the historic door and window designs. A number of the temporary buildings, specifically Butler buildings, have been re-sided, covering many of the original doors and windows. The massing and scale of these buildings remains unchanged, preserving the qualities of design, setting, feeling, and association with the WWII era.

The existing Cold War Historic District includes 50 properties that contribute to its significance, some of which are within the NHL but also have Cold War significance. Its boundaries are under review and slight revisions have been proposed to remove two, non-mission-related buildings from the boundary. USARAK will consult with the Alaska SHPO

regarding changes to the boundaries. For the purposes of this cumulative impact assessment, the larger boundary was considered.

Existing known archaeological resources and potential TCPs are located within the boundaries of USARAK training areas. Existing agreements with the Army, the Alaska SHPO, and the Alaska Native Tribes define the areas where on-ground training is restricted, and these restrictions avoid adverse effects to known resources.

In addition to these known historic districts, other historic resources could be identified at FWA because the entire installation has not been surveyed. The Army is in the process of conducting culturally significant site surveys on lands used for training to detect the presence of any existing TCPs. Actions that affect any resource at FWA are evaluated, and NRHP eligibility of affected resources is determined before action is taken. Likewise, archaeological properties that could be affected by training or construction in areas that have not yet been surveyed would be identified prior to implementation of a new training program or construction project.

Previous actions that have affected cultural resources within the NHL include the following:

- In 2001, demolition of 12 buildings, three of which (Buildings 1050, 1560, and 3009) were contributing elements to the NHL. Resulted in adverse impact.
- In 2005, exterior signage to Building 1021. Most new construction for any of the Proposed Actions would lie inside the boundaries of the Cold War Historic District. Resulted in adverse but temporary impact.
- In 2006, the BLM developed a *Master Plan* for the Alaska Fire Service (AFS). Resulted in no impact.
- In 2006, installation of fire alarm antennas within the NHL. Resulted in no adverse effect.
- In 2006, installation of roofs over the exterior fire escapes for Building 1557, Hangar 1. Resulted in no adverse impact.
- In 2007, construction of new family housing north of the NHL. Resulted in visual adverse impact to the NHL and specifically Building 1024.
- In 2008, construction of an Americans with Disabilities Act (ADA)-compliant ramp for Building 1047. Resulted in visual adverse impact and visible alteration to the exterior of a contributing element.
- The demolition of buildings within the NHL adversely impacted historic properties and the historic integrity of the NHL.

Projects determined relevant to the cumulative analysis are future construction actions of FWA Main Post not associated with the Proposed Action but planned for construction south of the Ladd AAF flight line. Future projects lie outside the boundaries of the NHL but could affect the viewshed or other aspects of its historic integrity. Figure 4.12.a details planned construction projects, most of which are included as part of Alternatives 2 or 3.

Design and even final siting of future projects not associated with the Proposed Action has not been completed to a point to assess potential adverse effects (or resulting cumulative effects) to the districts or their contributing elements. USARAK will complete Section 106 evaluation and consultation for each of these projects and, in accordance with Section 106 requirements, assess the direct and cumulative effects on the historic integrity of historic resources.

The Proposed Action would result in a positive effect on the NHL as a result of expanded training and operations because these activities ensure continuation of the NHL's historic use as an airfield.

The direct effects of the Proposed Action have a significant adverse effect on cultural resources. Although future actions would also be evaluated for adverse effect under the Section 106 process, there is potential that these actions could have adverse effects. The overall cumulative effect to cultural and visual resources, therefore, is also significant.

4.12.4.3 Noise

Actions affecting noise involve those that change the type, frequency, or patterns of aircraft travel near sensitive human and wildlife receptors. Noise has been a long-standing issue of concern in the Anchorage area, and the issue of cumulative effects of noise was raised during scoping. As discussed in Subsection 3.4.2, noise problems at FRA are limited to small geographic areas, and noise levels off the installation are decreasing as a result of new equipment. This trend is expected to continue as a result of other USAF actions. Neither Alternative 2 nor 3 would increase noise from existing levels. The other actions relevant to cumulative impact analysis for noise include:

- BRAC Stationing Actions
- Beddown of F-22s at Elmendorf AFB
- Beddown of C-17s at Elmendorf AFB

Noise levels under both Alternatives 2 and 3 would not change. The frequency of noise annoyance experienced with helicopter flights and takeoffs and landings would increase, including in areas over non-military lands. Despite the fact that noise levels would not increase under the Proposed Action alternatives, other actions were evaluated to determine if cumulative impacts would occur.

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USAG-AK DEVELOPMENT PROJECTS*

1391 PIN	Project Title
	2008
68853	Unit Operations Facility-GTA
68856	Construct Barracks-GTA
66835	Company Operations Facility
66845	Railhead Operations Facility Phase 1
60054	School Age Services (SAS)
	2009
63006	Stryker Mechanized Vehicle Wash Facility
63080	Stryker Maintenance Hardstands
34129	Training Support Center
61530	Barracks Complex
	2010
66846	Railhead Operations Facility Phase II
61507	3rd ASOS Air Support Facility
65076	ATF Permanent Facilities, PH1
	2011
67112	ATF Permanent Facilities, PH2
71697	Urban Assault Course Upgrade
	2012
67113	ATF Permanent Facilities, PH3
	2013
67116	ATF Permanent Facilities, PH4
62302	Combat Pistol Qualifying Course
61681	Modified Record Fire Range
59982	Barracks
	2014
61508	Replace Melaven PFC + Swimming Pool
	2015
64018	Stryker Permanent Facility
	Long Range
65217	Pedestrian Overpass
61224	Military Working Dog Facility
68854	Construct Company Ops and TEMF
14453	Education Center
61526	Child Development Center (<6yrs)
62305	Initial Staging Base (DTA)
61502	Police/Military Police Station
65728	Indoor Range
61524	Replace Bailey Bridge
61225	In-Out Processing with ACS
61821	Truck Loading Complex
61505	Replace Fire Station #2
58907	Intelligence Operations Facility
59790	Brigade Motor Pool, Phase 3
61239	Installation Warm Vehicle Storage
61504	Replace and Consolidate Fire Stations #1 & #3
61509	Duplex Company Operations Facility
61525	Trainor and Badger Access Control Points
63082	Security Road/Fitness Trials
66143	Multipurpose Machinegun Range
70317	Construct 400 Capacity Chapel
70318	Construct Ammo Magazines
70319	Construct Air Operations Building
70320	Construct DOL Maintenance Facility
70849	Construct 400 Capacity Chapel
73598	TFPS Simulator Building
59427	Qualification Training Range

*Development projects shown also include Alternative 2 Aviation Task Force development projects.

LEGEND

- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- Long Range
- Demo
- Future Structure

SOURCE: Fort Wainwright Public Works
USAG-AK Future Development Plan, (March 3, 2009).

0 1,800 3,600 Feet

1 inch = 1,800 feet

N

FIGURE 4.12.a
Future Development Projects at Fort Wainwright
USARAK Aviation EIS

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Noise analysis has not been conducted cumulatively for the BRAC stationing actions but noise information is available from the other actions and can be qualitatively assumed to decrease based on the decrease in the number and type of aircraft located at Eielson and Elmendorf AFBs from BRAC. The BRAC stationing actions result in a net decrease in the number and type of aircraft assigned to Eielson AFB and Elmendorf AFB. No new aircraft would be assigned to Eielson AFB under the BRAC actions. The noise effects of training at Eielson AFB, therefore, would be reduced from BRAC actions at Eielson AFB.

The addition of three C-27 J Spartans would replace several C-12 Hurons at Elmendorf AFB. There are no existing noise data for the C-27 J but the *Programmatic Environmental Assessment for Army National Guard Transformation Equipment* made an assumption that the C-27 J noise levels would be similar to the C-130 J. This assumption could be made because the C-27 J has the same propellers, digital avionics, floor strength, and two of the four engines of the C-130 J. There is no perceptible change expected by the use of the Spartan with respect to the Huron. Overall, the effects are considered minor. Other noise effects at Elmendorf AFB can be explained in the F-22 and C-17 actions below.

The F-22 action would replace most of the F-15 operations with the new F-22s. Noise analysis was conducted and presented in the EA (Elmendorf AFB, 2006). The noise analysis indicates that the 65-dBA contour would extend to areas west of Elmendorf AFB and a portion of Knik Arm, but that noise would not affect humans in the affected areas. Noise from training exercises would not cause a consistent increase in noise in most areas but would result in a higher number of sonic booms in several MOAs. Communities affected by the increase in sonic booms are primarily Native villages. The projected increase in sonic booms would not pose a health or other risk, but could increase annoyance.

Training for the C-21s would occur at Allen AAF, and the runway would be extended by approximately 350 feet. No homes are located within a couple of miles of the original or extended runway, and noise from C-21 training activities at the field would not affect any offsite noise-sensitive receptors.

The cumulative actions affecting FRA could increase noise around this installation but the effects would be less than significant because noise extending off military installations would not extend into populated areas. Because Alternative 2 of the Proposed Action does not involve any changes to military training in the FRA, the cumulative effect applies to Alternative 3 only.

4.12.4.4 Hazardous Materials/Hazardous Waste

Actions affecting hazardous materials/hazardous waste involve those that increase the quantity of hazardous materials and hazardous waste or increase potential exposure of existing subsurface contamination. The geographic scope of cumulative analysis of this VEC is FWA.

The Proposed Action and alternatives would involve impacts resulting from the increased military O&M activity and construction on contaminated areas. The demolition of two of the buildings could result in moderate impacts.

A variety of future construction projects at FWA is proposed associated with Grow the Army (USARAK, 2008) and other MILCON projects. The location of these projects, along with the construction projects proposed by Alternatives 2 and 3, is shown in Figure 4.12.a.

In addition, realignment and/or consolidation of personnel and aviation assets as anticipated with Grow the Army will add to cumulative effects of hazardous materials/ hazardous waste by increasing the amount of hazardous materials and hazardous waste generated (USARAK, 2008). The increased quantity of O&M materials at new facilities would increase the likelihood of spills. Training activities may result in the generation of hazardous materials and waste and training would increase the use of explosives and ammunition. Subsection 3.5.3 discussed existing DoD contracts in Alaska for disposition, sale, and disposal of hazardous materials and hazardous waste for both the Army and the USAF, and these contracts have no identified constraints for handling the increased quantities of hazardous materials and hazardous wastes anticipated under either Alternative 2 or Alternative 3 (Gray, 2009, personal communication).

Construction of new military and non-military facilities may increase the potential to expose subsurface contamination and may result in the generation of more hazardous waste. Increasing pressure on and limited availability of "clean" construction locations may mean that USARAK will need to construct new facilities on contaminated sites. This military construction needed at FWA is anticipated to require coordination with the EPA and State of Alaska. The limited availability of non-contaminated construction sites may limit or delay implementation of needed facilities and result in a cumulative impact to the military mission in terms of inadequate or costly facilities.

The overall cumulative effect to disturbance of hazardous waste sites would be minor to moderate but less than significant because systems are in place to remediate contaminated sites. Existing Alaska DoD hazardous materials and hazardous waste contracts have adequate capacity to handle additional wastes generated from increased O&M activities on military installations in Alaska.

4.12.4.5 Wildlife and Fisheries

Large mammals and bird species would be affected by both Alterative 2 and Alterative 3. Fisheries are not affected under either alternative so they are not discussed in the cumulative impact analysis. The primary impacts to wildlife from military activities in Alaska are related to training activities, both ground- and air-based. Effects of training activities of the Proposed Action include effects of increased use of flight corridors and increased training at USARAK's existing training lands. Other activities that affect the flight corridors or USARAK training lands were evaluated to determine if, along with other actions affecting the same species using or migrating through these areas, cumulative effects could result.

The species considered for the analysis of cumulative effects are the same considered for the direct and indirect effects of the Proposed Action. These include those species identified as being indicator species: moose, caribou, Dall sheep, bison, brown and black bears, beluga whales, migratory waterbirds, sandhill cranes, raptors, neotropical migratory birds and other sensitive species.

Wildlife and fisheries have been adversely affected by previous military and non-military development in Alaska. Habitat has been fragmented, and the introduction of noise and human activity has changed wildlife distributions in the State. However, vast portions of Alaska are still relatively undisturbed, and wildlife and fisheries are extremely valuable from ecological, economic, and subsistence perspectives. A discussion of impacts from past

infrastructure projects, land management policies and practices, use of renewable natural resources, community development, and military activities can be found in USARAK, 2004. Construction of facilities on military installations has fragmented habitat and introduced human activity. Construction of facilities on existing installations, however, has only a minimal continued effect because the impacts of the buildup of infrastructure has occurred, and new construction generally occurs in developed or disturbed areas. Management practices and procedures to manage adverse effects from construction, such as storm water runoff, are established and effective.

Other flying missions that have the potential to cumulatively affect wildlife include:

- Beddown (and training) of F-22s at Elmendorf AFB
- Beddown (and training) of C-17s at Elmendorf AFB
- BRAC Stationing Actions
- Northern Rail Extension

The relocation of the Air National Guard 176th Wing involves moving aircraft basing from near the Anchorage airport to Elmendorf AFB. Neither Kulis Air National Guard Base nor Elmendorf AFB is home to important wildlife, and training patterns and activities would not change as a result of the relocation. This project, therefore, is not included for cumulative effects assessment.

The following discusses the potential cumulative impacts to the species affected by the Proposed Action.

Moose

Moose are affected by ground-training activities and construction associated with Alternatives 2 and 3. Short-term displacement and some disturbance to animals within the immediate vicinity when training commenced would occur during training events. Multiple training events associated with increased training from expanded training facilities, such as BAX/CACTF, and increased personnel, associated with Transformation and Grow the Army, would increase the frequency and duration of these disturbances. Moose are less affected by noise from high-altitude aircraft, which would be operated by the USAF. The cumulative impacts of the flying missions, therefore, are minimal.

Training and construction at Elmendorf AFB associated with USAF beddown and BRAC actions would add to the cumulative effect of increased training at FRA associated with Alternative 3. Construction of facilities at Elmendorf AFB and use of the runway at Allen AAF associated with USAF actions would also disturb moose in the area. The USAF employs BMPs to manage adverse effects to moose, and resulting impacts are temporary and minor.

The Northern Rail Extension project is projected to cause minor habitat loss and fragmentation by the rail line. Habitat for 12 moose is projected to be lost (STB, 2008). This impact would not affect moose populations.

The combination of future actions affecting moose populations would have a minimal cumulative effect on moose. The cumulative impact, therefore, is less than significant.

Caribou

Caribou populations occur and could be affected by the Proposed Action in areas along the flight corridor between FRA and FWA (Richardson Highway) and in the foothills of the Alaska Range near DTA. Short-term displacement and some disturbance to animals would occur during training exercises but would not permanently affect caribou populations along flight corridors or at training areas, including DTA.

Training associated with the C-21 beddown would also occur at DTA and could affect the caribou populations in this area. Although most of the training activities occur at the edge of the caribou range, there is still potential for noise and human activities to disturb caribou, particularly during foraging season. To protect caribou, training is restricted to 3,000 AGL during calving season (May 15 to June 15).

The F-22 beddown also would have minimal impacts on caribou. First, F-22s fly at high altitude, so noise from normal aircraft operation is minimized. More than 98 percent of F 22A training flights would be above 2,000 feet (Elmendorf AFB, 2006). Second, the USAF has existing airspace restrictions that prevent potential overflight effects on caribou (USAF, 1995). Finally, because F-22s fly at a higher altitude than F-15C or F-15E aircraft, supersonic activity is also at a higher altitude, reducing the overpressure experienced on the ground. As noted in the EA assessing the F-22 action, the "extent of the sonic boom footprint generated by an F-22A is larger than that generated by an F-15, [but] the actual overpressure (psf) experienced on the ground is only about 75 percent of that resulting from an F-15 boom because on the ground booms generated at high altitude are weaker than those at low altitude."

The BRAC actions result in fewer types and numbers of aircraft assigned to Elmendorf AFB and Eielson AFB. The reduction in aircraft corresponds to a reduction in training activity that will reduce overall noise generated and minimize effects to caribou and other wildlife.

Caribou would generally not be common along the Northern Rail Extension rail line (STB, 2008). A minor amount (less than 1 percent) of available habitat would be lost from construction of the rail line. Because caribou are uncommon in the region, impacts of mortality due to direct collisions, reduced reproduction rates, or displacement would be negligible (STB, 2008).

The combination of future actions affecting caribou populations would have a minor cumulative effect on caribou. Effects would be centralized at DTA and are controlled by training restrictions imposed by USARAK and USAF during calving season. The cumulative impact, therefore, is less than significant.

Dall Sheep

Small numbers of Dall sheep occur in the DTA and could be affected by low-altitude training. Increased air- and ground-training associated with the Proposed Action and other Army actions could increase disturbance of Dall sheep but because the numbers of animals is small and they disperse during training activities, cumulative impacts would be minor.

Although Dall sheep are less affected by the high-altitude training of C-21s and F-22s, the USAF has overflight restrictions over Dall sheep lambing/calving, wintering and rutting areas beneath airspace that would protect Dall sheep.

The BRAC actions result in fewer types and numbers of aircraft assigned to Elmendorf AFB and Eielson AFB. The reduction in aircraft corresponds to a reduction in training activity that will reduce overall noise generated and minimize effects to Dall sheep and other wildlife. The EAs for C-22 and F-22 actions do not identify any impacts to Dall sheep resulting from these USAF actions.

Dall sheep habitat is not present along the Northern Rail Extension rail line, and Dall sheep, therefore, are unlikely to be affected by this project.

The combination of future actions affecting Dall sheep would have minimal effects. There are limited numbers of Dall sheep present within the IA, and training restrictions protect Dall sheep. The cumulative impact, therefore, is less than significant.

Bison

Training exercises that occur in DZs within the calving range, such as the Sally DZ, during the early part of the calving season could result in displacement and put newborn calves at risk of being trampled by other bison. Agreements between ADF&G and USAG-AK are currently in place to reduce potential disturbance of the bison herd at the DTA (see Subsection 3.6.1.2 for descriptions of special management areas for bison in DTA). The Army will continue to 1) minimize disturbance to bison calving areas on DTA during April 15 – May 31, if bison are present, and 2) minimize disturbance to bison pre-migration areas during July 1 – August 31, if bison are present. In addition, the Army does not conduct ground-training activities or operations within 2,000 meters of any bison during any time of year to minimize the impacts on bison (USAG-AK, 2007a). The impacts to bison from training would be less than significant because the mitigation measures would effectively limit disturbance and/or displacement of bison from important habitats; thus, long-term changes in population use of habitats or adverse impacts on reproduction or productivity are unlikely.

The eastern end of the proposed Northern Rail line is home to the Delta bison herd. This herd could be affected by collisions with trains; based on data from vehicular collisions on the Richardson Highway near the proposed rail line, the effects would be small, and any mortality would be inconsequential to the herd (STB, 2008). The cumulative impact, therefore, is less than significant.

Bison are not present around Elmendorf AFB and, therefore, would not be affected by USAF actions in the FRA area.

Brown and Black Bears

Minimal effects to brown and black bears along flight corridors would be expected under either Alternative 2 or Alternative 3. Alternative 3 involves increased flight corridors and, therefore, greater geographic scope of impact, so it has more impact than Alternative 2 but still minimal.

The USAF has overflight restrictions protecting bears. These restrictions reduce effects to black and brown bears. The USAF future actions, therefore, would not accumulate with USARAK actions to have an adverse effect to bear populations.

The Northern Rail Line would have an inconsequential direct effect on either black or brown bear habitat but habitat fragmentation could displace bears near the rail line. The amount of displacement is not quantified by STB (2008) but could be detrimental.

The combination of effects of multiple actions could have a minor effect on brown and black bears, especially near DTA where combined effects of overflights and rail barriers could negatively affect these species. The cumulative impact would not be expected to affect bears at a population level, and the impact would be less than significant.

Beluga

The Cook Inlet beluga whale population has declined substantially since the 1970s and continues to decline even after subsistence hunting of the beluga whales was curtailed in 1999. Concern over the viability of the beluga whales' population prompted NMFS to list the Cook Inlet distinct population segment of beluga whales as endangered under the Endangered Species Act of 1973 (ESA). The causes for the decline are not well understood but are thought to be linked to municipal, industrial, and recreational activities in the upper Cook Inlet and to overharvest of beluga whales (NMFS, 2007). Because the causes of decline are not well understood, biologists have not yet been able to identify the features of the habitat essential for the conservation of the Cook Inlet beluga whale population (NMFS, 2007). Research supporting the proposed listing of the beluga whale (NMFS, 2007) does not indicate that military activities are a threat or potential cause for decline of the beluga whale but, again, because the causes for decline are not well understood, it is possible that noise from military training activities could affect beluga whales.

As noted in Subsection 4.6.2.3.4 of the EIS, beluga whales can be affected by low-altitude helicopter operations and could be affected by the Proposed Action if low-altitude training exercises were conducted near the Eagle River and near-shore waters of Cook Inlet adjacent to FRA, and beluga whales were present during those exercises. Use of the area by beluga whales is not well documented, and training is not expected to affect this area. USAF activities associated with the C-17 and F-22 beddowns are unlikely to affect beluga whales because training occurs at higher altitudes and would not create significant noise effects at the surface or underwater (Elmendorf AFB, 2006; USAF, 2007).

The Northern Rail Extension is not near to, and would not affect, beluga whale populations.

Combined impacts of the Army and non-Army projects would have a little to no effect on beluga whales. The cumulative impact, therefore, is less than significant.

Migratory Waterbirds

Migratory waterbirds could be affected by disturbance of migrating waterfowl at FRA and Tanana Flats, and an increase in the potential for bird-strike hazards. These effects are worse for Alternative 3 than Alternative 2 because Alternative 3 increases the geographic scope of flight corridors and increases intensity of use of the training ranges. Impacts under both alternatives, however, are minimal.

Migratory bird species on Elmendorf AFB could be affected by increased flight activity associated with both the C-18 and F-22 beddowns. Bird strike hazards could increase with increased activity but these hazards are well-managed as part of flight safety procedures, and population effects from these strikes would not occur. Migratory birds would be

affected by construction in the forest stand in the southeast part of the base as part of the F-22 beddown. Construction would affect marginal habitat, and no long-term adverse effects are anticipated. Noise is not anticipated to significantly affect any bird species.

The Northern Rail Extension would affect a small portion of available habitat and a small portion of the overall population of waterfowl in the project area. Of an estimated population of 480 individuals within the project area, density is expected to be reduced by two individuals as a result of the action.

Combined impacts of the Army and non-Army projects would have a minimal effect on waterfowl. The cumulative impact, therefore, is less than significant.

Sandhill Crane

As noted previously, all birds have the potential to be affected by military training in Alaskan airspace. Specific impacts for the sandhill crane, although minor, were identified for the Proposed Action and, therefore, the potential cumulative effects on this species are considered here. The flight corridor between FWA and FRA transects a primary migration corridor used by large numbers of cranes that fly along the northern foothills of the Alaska Range. In this area, helicopters could encounter large flocks (up to 1,000 birds) of migrating cranes. Impacts could be mitigated by restricting the times of overflights of the Delta River and DTA during spring and fall migration (after mid-morning) and increasing flight altitudes along the flight corridor between FWA and FRA to a minimum of 1,000 feet AGL.

The other projects have little potential to affect sandhill cranes. USAF training has little effect on sandhill crane flight patterns because aircraft fly at higher altitudes and aggressive bird-strike hazard policies are in place to avoid conflicts between aircraft and birds. According to the F-22 EA, bird strikes have been limited to approximately five per year (Elmendorf AFB, 2006), most occurring at the airfield or during low-level training exercises.

No impacts to sandhill cranes were identified from either USAF beddown action. Effects to the sandhill crane from the Northern Rail Extension are included in the very minor effects to waterfowl generally.

Because other projects have little to no effect on sandhill cranes, the effects to this species are limited to the direct and indirect effects of Alternatives 2 and 3 as described in this EIS. There is no cumulative effect to this species.

Raptors

Low-altitude flights and hovering of helicopters in training areas have the potential to increase disturbance of nesting raptors. Bald eagles are present through USARAK training areas and could be affected by both air- and ground-based training. Alternative 3 has a greater effect on bald eagles than Alternative 2 because of the addition of helicopters at Eielson AFB. Buffer zones around eagle nests are employed by both USARAK and the USAF, which reduce the chance of disturbance.

Aircraft noise has not been shown to have a major effect on bald eagles, especially at the altitudes flown by C-17 and F-22 aircraft. The USAF, therefore, concluded no effects on bald eagles or other raptors associated with these actions.

Raptors could be affected by the Northern Rail Extension from collision with power lines and communication towers, loss of nesting trees, and habitat loss or alteration. More raptors, and particularly owls, are estimated to be affected by the rail line than any other bird species. As many as 91 individuals may be affected but this number represents a small fraction of the overall population. The project is not anticipated to have a significant effect on raptors during construction or operation (STB, 2008).

Raptors generally, and bald eagles specifically, could be affected by the combined Army and rail projects. Although the types of impacts are different, mortality would likely increase for this species as a result of both actions but the combined impact would not be expected to affect bald eagles at a population level, and the cumulative effect, therefore, is less than significant.

Neotropical Migratory Birds and Other Sensitive Species

Several leks for the sharp-tailed grouse occur in DZs at the DTA. This species could be affected if training took place during breeding season but could be avoided if training did not occur during this short period (May). Leks are not present at FRA; the USAF actions near FRA, therefore, would have no effect on this species. Other neotropical birds are well dispersed in training areas and unlikely to be affected.

Neotropical birds would be affected by the Northern Rail Extension but, as with other bird species, the numbers affected would not be substantial enough to cause an impact to the population. Long-distant migrants, however, would be moderately affected (SRB, 2008).

The cumulative effect to neotropical birds would be minor because the military effects are very small, especially considering training restrictions that could be placed during breeding season. As with raptors, cumulative effects to neotropical birds from Army and rail projects would be different but would combine to have a minor effect these birds but not at a population level. The cumulative impact, therefore, is less than significant.

4.12.4.6 Socioeconomics

The Proposed Action would put pressure on housing resources at FWA and, under Alternative 3, at FRA. These shortages apply to on-Base housing for unaccompanied Soldiers in particular but short-term deficits in family housing would also occur. Since scoping in 2007, where the issue was raised for Fairbanks, housing in FNSB has increased by 22 percent, so there is sufficient housing in the community to accommodate Army families who need to live off FWA. However, that would result in higher housing costs and longer commutes.

There are no private actions that are anticipated to lead to a rapid population increase in Anchorage or Fairbanks, but Grow the Army would increase Soldiers at these locations and has the potential to combine with the Proposed Action to make installation housing shortages worse, particularly under Alternative 3. If Soldiers needing housing under Grow the Army are added to the baseline presented in the EIS, the barracks housing shortage at FRA and FWA would worsen and could reach significant levels where expansion of housing resources was required.

Grow the Army would bring 425 additional Soldiers to FWA, of whom an estimated 44 percent (187) would require barracks space; supporting projects include construction of

two barracks to house 186 personnel (USARAK, 2008). The remaining 56 percent (238) would require family housing, 50 percent of which (119 units) should be on FWA under FWA's current housing program, adding to the estimated shortage of 525 family units at FWA if Alternative 3 is selected. The Army is in the process of preparing a new HRMA for FWA, which will validate the housing requirement; if Alternative 3 is selected, the study would need to be revised to address that.

The EIS used baseline data from the 2007 Joint HRMA study for FRA and Elmendorf AFB; however, it appears that these data (based on a 2007 ASIP) did not account for Grow the Army, which follows a ROD signed in 2008. Grow the Army would bring an additional 1,773 Soldiers to FRA, of whom an estimated 44 percent (780) would be unaccompanied and need barracks space, and 56 percent (993) would need family housing (USARAK, 2008). The Grow the Army numbers for unaccompanied Soldiers would add directly to the shortage in barracks space (which is already in deficit by more than 600 beds). The related construction projects evaluated by the Grow the Army EA would provide an additional 463 barracks spaces at FRA (USARAK, 2008).

In his concurrence with the Joint HRMA, the Director of Public Works for USAG-AK noted that a personnel increase (assumed here to be Grow the Army) was anticipated for FRA and that, if reflected on FRA's 2008 ASIP, the Army would request the Air Force to revalidate Army requirements for family housing in an abbreviated HRMA.

Assuming the housing estimates for Grow the Army are on top of the Proposed Action, there would also be a shortage in family housing; Grow the Army would fill the available spaces, and there would be no family housing available for Alternative 3 requirements. Under these conditions, the housing situation at FRA would require substantial expansion, and there would be a significant cumulative effect to housing at FRA under Alternative 3.

4.12.4.7 Subsistence, Public Access, and Recreation

USARAK missions affect subsistence and recreation on its lands. Reduced access and increased pressure on existing resources occurs because the Army determines when its lands are available for public use, limits access to some areas because of safety reasons, and sets restrictions on the types and frequency of subsistence and recreation activities allowed on its properties. These restrictions affect Army training lands but not cantonment areas because recreation does not occur in cantonment areas. Under both Alternatives 2 and 3, a reduction in both temporal and spatial access to subsistence and recreation resources is anticipated; closures would be due primarily to military training exercises, and would include subsistence and recreational use closure, or seasonal closures, on those properties that could result in a possible increased risk of accidental injury. These impacts would be greater under Alternative 3 because training intensity would be greater and, therefore, closures may be more frequent or for longer durations. The Army implements and will continue to implement BMPs to reduce adverse effects on subsistence and recreation.

Other projects that have the potential to cumulatively affect subsistence include:

- Army combined training
- Beddown (and training) of F-22s at Elmendorf AFB
- Beddown (and training) of C-17s at Elmendorf AFB
- Northern Rail Extension

The USARAK Transformation EIS noted that restrictions on access to military lands would increase, and that combined airborne and ground-based training envisioned by Alternative 4 would incrementally increase the number of closures due to large-scale maneuvers on DTA. Overall, the effects were determined to be minor.

Increased C-18 training activity and associated noise would disrupt tranquility of subsistence hunting. Access restrictions during training would further disrupt access to public access, including subsistence and recreation. Sonic booms associated with F-22 training could disrupt enjoyment of subsistence hunting or recreation during training activities but activities would not be affected.

The Northern Rail Extension would create a linear barrier to free range of hunters across the area. It could directly affect communities' harvest of resources in the area by making the harvest more difficult because of limited crossing areas, less attractive because of the intrusion of noise and industrial setting, or less successful because of displacement of moose and other game species (STB, 2008). Reducing subsistence hunting in the project area also could create additional competition in adjacent use areas (STB, 2008).

Increased military and transportation activity along the Tanana River corridor would cumulatively affect subsistence and recreation because lands would be increasingly restricted from public use. Because the combined action would affect but not substantially reduce access or availability of lands, the impact would be less than significant.

4.12.4.8 Summary of Cumulative Impacts

Some cumulative adverse effects could occur to airspace management, cultural and visual resources, noise, hazardous materials/hazardous waste, wildlife and fisheries, socioeconomics (housing), subsistence, and public access and recreation. The preceding discussion of cumulative impacts is summarized in Table 4.12.c below. The No Action alternative is not included in the summary because it would not result in any changes to existing conditions.

TABLE 4.12.c
Summary of Cumulative Effects
USARAK Aviation EIS

Resource	Past and Present Actions	Other Future Actions	Alternative 2	Alternative 3	Cumulative Effect
Airspace Management	Alaskan airspace used by numerous military and civil aircraft. Air travel essential to transport of passengers, cargo, and mail. Limited road network through Alaska's vast land area results in air travel being the only available option for remote communities. Alaskan airspace provides a unique and vital training area for U.S. military forces.	No change in airspace proposed but increased and changed military use of airspace because of change in type and number of USAF aircraft using Alaskan airspace.	Increased helicopter use of existing airspace. No change to airspace designations.	Greater increased helicopter use of existing airspace, as compared with Alterative 2. No change in airspace designations.	No change in airspace designations proposed by USARAK. Concerns about increased congestion and existing conflicts (perceived and documented) among airspace users continue. Small potential for effects on VFR corridors. Continued coordination will be needed to mitigate potential impacts of congestion. Continued coordination with USAF regarding Delta TMOA, which could potentially result in congestion. Cumulative effects are anticipated to be less than significant.
Cultural Resources	Military development in Alaska during World War II and the Cold War is central to Alaska's history. Many historic resources from these periods have been demolished or altered as the military has downsized and transformed since the end of the Cold War.	Continued Transformation of military forces may affect World War II and Cold War-era historic properties.	Change in historic character and setting of NHL and historic district.	Same as Alternative 2	Cumulative impact of loss or alteration of World War II and Cold War era historic resources representative of Alaska's military legacy. Because the direct effect at FWA for either Alternative 2 or Alternative 3 would be significant, the cumulative effect at FWA would also be significant.

TABLE 4.12.c
Summary of Cumulative Effects
USARAK Aviation EIS

Resource	Past and Present Actions	Other Future Actions	Alternative 2	Alternative 3	Cumulative Effect
Noise	Military operations are a significant source of noise near training activities and along some training routes. Noise from aircraft in the FRA has been a source of continued community concern. Noise effects on wildlife have been studied widely, and most terrestrial wildlife either avoid noise-impacted areas or habituate to noise. High or sporadic noise levels near foraging and breeding areas do adversely affect most terrestrial wildlife. Live-fire activities create noise contours that create noise disturbance near human and wildlife populations, and these noise contours extend beyond the installation boundaries. Some residences in the Fairbanks area are affected by noise from USARAK training activities near FWA and Eielson AFB.	Noise associated with USAF training activities will likely decrease from proposed changes in USAF and Air National Guard aircraft basing. Noise would increase along the proposed Northern Rail Extension rail line.	Increased annoyance to residences in the Fairbanks area from increased helicopter training at FWA and Eielson AFB.	Annoyance to residences in the Fairbanks area from increased helicopter training at FWA and Eielson AFB greater than under Alternative 2.	Decreased noise around the FRA is a beneficial cumulative impact. Increased noise around FWA and Eielson AFB from USARAK helicopter training could be offset by decreased USAF training in the same region, and represents no more than a minor cumulative effect.
Hazardous Materials/ Hazardous Waste	Military operations increased generation and handling of hazardous of materials. Military training added explosives and ammunition to Alaska lands.	Increase generation and handling of hazardous of materials and increase potential exposure of existing subsurface contamination.	Increased generation and handling of hazardous of materials and increased potential exposure of existing subsurface contamination. Increased use of explosives and ammunition.	Similar to Alternative 2, with proportionally greater impacts based on increase in personnel and activities.	Increase generation and handling of hazardous of materials and increase potential exposure of existing subsurface contamination. The overall cumulative effect would be less than significant.

TABLE 4.12.c
Summary of Cumulative Effects
USARAK Aviation EIS

Resource	Past and Present Actions	Other Future Actions	Alternative 2	Alternative 3	Cumulative Effect
Wildlife and Fisheries	Wildlife and fisheries have been adversely affected by previous military and non-military development in Alaska. Habitat has been fragmented, noise and human activity have changed wildlife distributions in the State, and game species have been overharvested in some cases.	Proposed military actions have minimal effects. Land development would occur in previously disturbed areas and would not adversely affect habitat or wildlife populations. Change in use of Alaskan airspace has a neutral to positive effect on wildlife because USAF operations are generally at higher altitudes than current practices, thus dissipating noise effects on the ground. Land development at the Port of Anchorage and other areas in the Cook Inlet could adversely affect beluga whales and fisheries.	Minimal to minor impacts to most wildlife species.	Slightly higher than Alternative 2 because of increase scope and duration of training activities but impacts still expected to be minimal to minor, particularly when modifications to training schedules are implemented during breeding and other sensitive periods.	Flight activities from all sources, civil and military, may affect wildlife species. Raptors and neotropical bird species may be affected by cumulative actions of military and rail projects along the Tanana River. Continued decline of the beluga. Causes of decline and habitat need to be studied. Effects to sandhill cranes from Proposed Action only. Cumulative effects are anticipated to be less than significant.
Socioeconomics (housing)	Military housing, both barracks and family housing, constructed at FWA and FRA to support Soldiers stationed at these locations. Increasing stationing of Soldiers under Transformation has put pressure on housing, particularly barracks space.	Grow the Army and the Proposed Action would add to the housing shortages at both FWA and FRA. Military construction at FWA will alleviate barracks shortages in the long-term. Housing shortages at FRA would persist unless substantial expansion is implemented. No additional family housing construction is planned at either FWA or FRA.	Housing shortages at FWA would continue until planned barracks are completed. The in-process housing study will evaluate family housing needs. Sufficient housing is available off of the installation. No additional personnel would be stationed at FRA, so housing resources would not be affected.	Housing shortages at FWA would continue until planned barracks are completed. Planned barracks construction to support Grow the Army at FRA would house about half of the estimated single Soldiers. None is planned under the Proposed Action. There would be a shortage in family housing at both FRA and FWA that would not be alleviated by future construction, as none is planned.	The combined housing requirements under Grow the Army and the Proposed Action would stress housing resources at FRA and at FWA (to a lesser extent) and would represent a significant cumulative effect.

TABLE 4.12.c
Summary of Cumulative Effects
USARAK Aviation EIS

Resource	Past and Present Actions	Other Future Actions	Alternative 2	Alternative 3	Cumulative Effect
Public Access, Recreation, and Subsistence	Public access, recreation, and subsistence have been adversely affected by military and non-military development in Alaska. Subsistence areas have been fragmented and resources have changed with time.	The Northern Rail Extension could further fragment public access to recreation and hunting areas.	No or very low impact.	Same as Alternative 2.	Recreation and subsistence areas are not heavily used. Access would be affected by military activities and the proposed rail line but these impacts would still be considered minor.

4.13 Irreversible or Irretrievable Commitment of Resources

Irreversible or irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (for example, energy from hydrocarbons and minerals) that cannot be replaced within a reasonable period of time. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored after implementing a Proposed Action (for example, extinction of threatened or endangered species).

Increased training and operation of new facilities would require increases in use of electricity, hydrocarbon fuels, and water. Construction of facilities would require the use of construction materials, such as concrete and steel; although the materials could be recycled, some permanent loss of energy would be expected in the manufacture and recycling processes. Use of such resources is irretrievable.

Increased training and construction of facilities would result in some loss of vegetated areas within FWA and the training areas. Many of the affected areas have been previously disturbed but some may affect vegetation or habitat areas that support biological resources. These areas could be revegetated and restored when military use of the land is no longer needed. These effects, therefore, do not represent an irretrievable commitment.

Loss of cultural resources would be irretrievable but would not occur under the Proposed Action. The Proposed Action would have adverse effects to the NHL but no buildings would be permanently lost or physically altered. Changes to the historic setting could be reversed in the future should the military mission change.

4.14 Short-Term Uses of the Environment and Maintenance and Enhancement of Long-term Productivity

Short-term impacts of the Proposed Action alternatives could result in minor adverse impacts. Increased soil erosion could result from disturbance of soils, and waterways and wetlands could be subjected to increased sedimentation from storm water runoff. Localized air quality could be adversely affected from increased dust and operation of construction equipment. Construction could also generate increased noise on a short-term basis. There would be a short-term beneficial socioeconomic impact associated with jobs and materials purchases during the construction period; housing demands would stress available resources, particularly until planned facilities could be completed. During training exercises, wildlife could be displaced on a short-term basis until the training activity (such as from use of DZs) is completed.

The implementation of design features; BMPs; standard construction practices; other measures described in this EIS; adherence to existing management plans and programs; and federal, State, and local regulations that would be incorporated into the Army's Proposed Action is aimed at the sustainability of the USARAK mission. With increased training activity, short-term uses of the Alaskan airspace would become more frequent and intensive. The Army would continue to coordinate with other airspace users to ensure that Alaska's airspace remained productive for all users. The long-term productivity of USARAK lands and Alaskan airspace would not be affected by the Proposed Action alternatives.

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