Programmatic Environmental Assessment for Army 2020 Force Structure Realignment

Chapter 4
Affected Environment
and
Environmental Consequences

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4.16 FORT POLK, LOUISIANA

4.16.1 Introduction

The Joint Readiness Training Center (JRTC) and Fort Polk is located in west-central Louisiana in Vernon, Sabine, and Natchitoches parishes, near the communities of Leesville and DeRidder, and about 15 miles east of the Texas-Louisiana border (see Figure 4-16.1). Fort Polk is divided into two separate land masses: Fort Polk Military Reservation (main post) and Peason Ridge Training Area. The main post consists of 107,024 acres, which includes approximately 67,000 acres of Army-owned land on the northern portion of the installation and another 40,000 acres of land managed by the USFS.

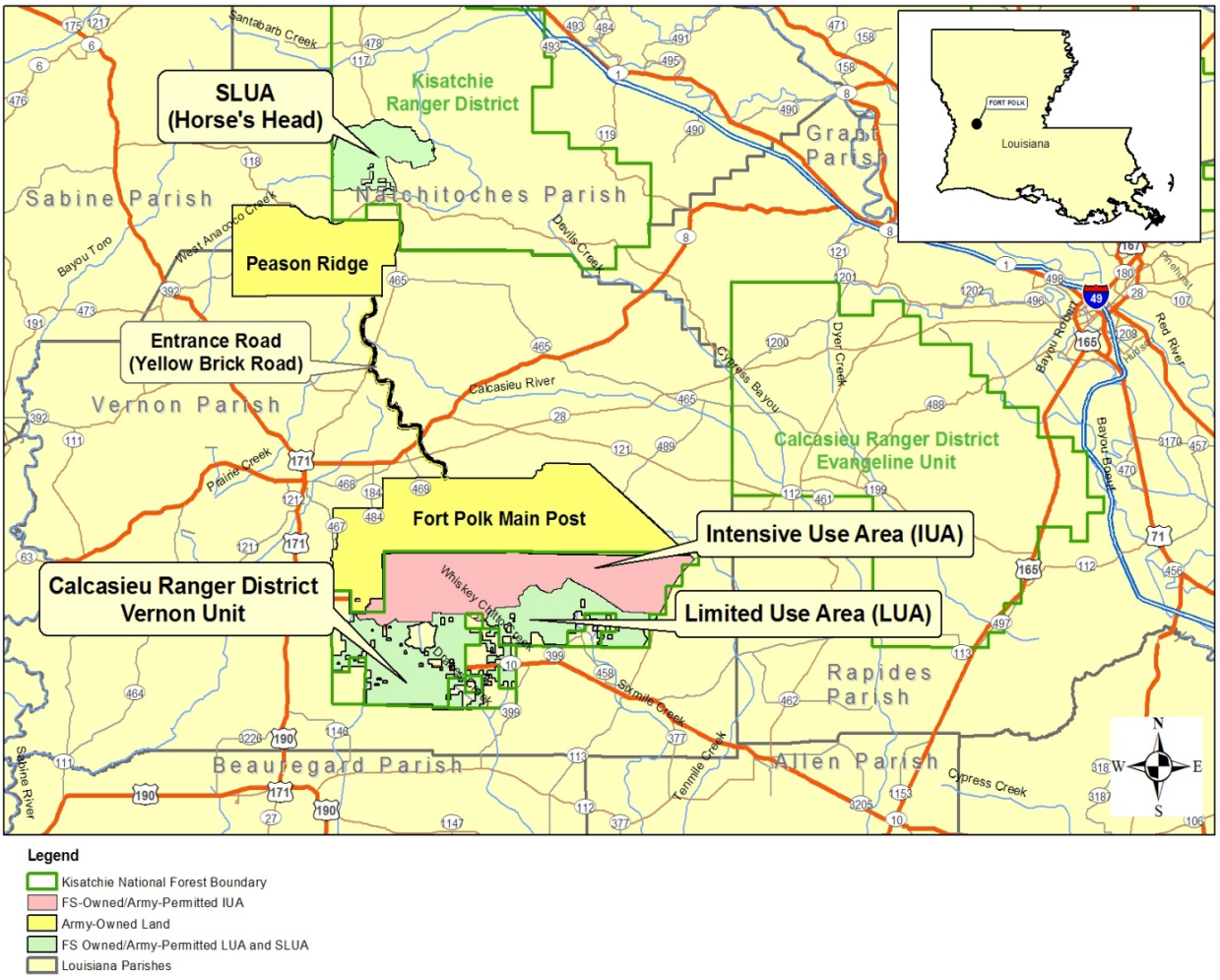

Figure 4.16-1. Fort Polk

Peason Ridge is located approximately 15 miles north of the main post, and in Vernon, Sabine, and Natchitoches Parishes. Peason Ridge is approximately 33,490 acres. Peason Ridge is used to support both Army maneuver and live-fire training, but is not utilized for long-term housing of Army personnel or civilians, which occurs on the main post. Additionally, the Army has leased a parcel of land to support the transport and convoys of units to and from main post to Peason Ridge.

The Army owns 26 acres of lakefront property at Toledo Bend Reservoir which is located approximately 45 miles northwest of Fort Polk in Sabine Parish. This recreational area is operated by the Fort Polk FMWR.

Lands utilized on the USFS, Kisatchie National Forest, are governed by a special use permit agreement and operating plan. Fort Polk utilizes approximately 40,000 acres of National Forest Lands in the southern portion of main post referred to as the Intensive Use Area (IUA). This area is used for live-fire training. Adjacent to and south of the IUA is the Limited Use Area (LUA). The LUA consists of approximately 45,000 acres of land, which is available for foot and vehicle maneuver training only. No live-fire activities are performed in these areas.

North of Peason Ridge is an area of USFS land, referred to as the Special LUA (SLUA), or "Horse's Head", due to its configuration. The SLUA consists of 12,380 acres and is available for limited training by the JRTC and Fort Polk (Table 4.16-1).

Table 4.16-1. Army and Forest Service Real Property Acreage on Fort Polk

Real Property Parcel	Administering Agency	Size (acres)
Main Post	Army	66,998
Peason Ridge	Army	33,491
Intensive Use Area	Forest Service	40,481
Limited Use Area	Forest Service	44,824
Special Limited Use Area (Horse's Head)	Forest Service	12, 380
Total		**198,174**

In February 2010 Fort Polk completed the *Joint Readiness Training Center and Fort Polk Land Acquisition Program Environmental Impact Statement.* Expansion of Fort Polk, up to 100,000 acres, was analyzed and the installation received the authorization to actively pursue the land purchase program. In FY 2012 the USACE began closing on some of these new properties. A four stage process was analyzed in the EIS to assist the installation in preparing these lands for training. Since newly-acquired lands are not ready for training and are not yet in use by the Army, they are not reflected in the training inventory. This analysis focuses on the land that currently is being used to support the Army mission, and, therefore, does not include analysis of environmental impacts on newly acquired parcels which are not yet in the current training land inventory.

Fort Polk currently has approximately 136,000 acres of maneuver area suited for vehicle and non-vehicular military training. It has long supported armored and mechanized unit training and dismounted infantry unit training, and is home of the Army's JRTC. The JRTC is the Army's premier combat training center for infantry units. JRTC is one of the three Combat Training Centers that conduct thorough, realistic, multi-echelon, joint, and combined arms training. The purpose is to train leaders to deal with complex situations; to create flexible, skilled Soldiers; and develop highly proficient, cohesive units capable of conducting operations across the full spectrum of conflict. In FY 2011, JRTC executed six Mission Rehearsal Exercises, one Full Spectrum Operations/Direct Action exercise and two Special Operations Force rotations. Currently six Mission Rehearsal Exercises are scheduled for FY 2012 and nine training rotations are scheduled for FY 2013.

Fort Polk is home to the JRTC Operations Group, the 1st MEB, 10th Mountain Division (4/10 BCT), 1st Battalion (Airborne), 509th Parachute Infantry Regiment (1-509 (Airborne), 162nd Infantry Training Brigade (Foreign Security Forces-Transition Team), 5th Aviation Battalion, and the 115th Combat Support Hospital. Fort Polk's primary missions include supporting the training

and quality of life of these resident units, as well as the training the brigades and battalions that travel to the JRTC to complete large-scale maneuver training events.

Fort Polk has a well-developed range infrastructure. As a Training Center its primary capabilities include a large force-on-force maneuver area and an instrumented live-fire maneuver area. Encroachment from urbanization is not yet a challenge, but ranges do require land management and maintenance to remain in optimal condition for training.

4.16.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, Fort Polk does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 5,300 Soldiers and Army Civilians) or Alternative 2 (Installation gain of up to 1,000 Soldiers). The Army does anticipate significant adverse socioeconomic impacts to regional economic activity, housing, and school districts within the ROI for Alternative 1. Table 4.16-2 summarizes the anticipated impacts to VECs from each alternative.

Table 4.16-2. Fort Polk Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 5,300	Alternative 2: Growth of up to 1,000
Air Quality	Negligible	Beneficial	Minor
Airspace	Negligible	Negligible	Negligible
Cultural Resources	Negligible	Negligible	Negligible
Noise	Negligible	Negligible	Negligible
Soil Erosion	Minor	Negligible	Minor
Biological Resources	Negligible	Negligible	Negligible
Wetlands	Negligible	Negligible	Minor
Water Resources	Negligible	Beneficial	Minor
Facilities	Negligible	Beneficial	Less than Significant
Socioeconomics	Negligible	Significant	Negligible
Energy Demand and Generation	Negligible	Beneficial	Negligible
Land Use Conflict and Compatibility	Negligible	Negligible	Minor
Hazardous Materials and Hazardous Waste	Negligible	Minor	Minor
Traffic and Transportation	Negligible	Beneficial	Minor

4.16.1.2 Valued Environmental Components Dismissed from Detailed Analysis

For the VECs discussed in this section below, no more than a beneficial or negligible impact would be anticipated. Therefore, these VECs are not being carried forward for detailed analysis, as no potential for significant impacts exists.

- ***Airspace.*** The JRTC and Fort Polk manages a dedicated SUA that spans 1,100 square miles, with the military installation in the center. The SUA defines the airspace in which military aircraft vertical and horizontal activities must be limited or restricted. Flight restrictions and communication requirements within this area are not imposed on nonparticipating aircraft operating according to visual flight rules.

  Fort Polk has two restricted areas within the MOA on the installation and operates these areas in accordance with the SUA requirements. Fort Polk has access to this airspace continuously and air operations take place day and night within this area.

  The No Action Alternative would not produce any conflicts with overlying restricted airspace. Impacts of Alternative 1 would be negligible. The use of airspace would not change significantly with the loss of ground units as a result of implementation of this alternative. Aviation and UAS would continue to require airspace to support training. This implementation of Alternative 1 would result in a slight and marginally lower utilization rate of existing military airspace as some units with UAS may be inactivated and no longer require activation and use of the airspace. Use of the installation air space would be scheduled to coordinate with existing mission activities. The loss of these units to Fort Polk would decrease operations of UAS, and use of this airspace would continue to be managed through scheduling and balancing training requirements with airspace availability.

  There would be a negligible impact to airspace as a result of the implementation of Alternative 2. The increased use of airspace would likely remain unchanged or could change with a negligible increase. Additional airspace would not be required, and scheduling, activation, and utilization of existing military airspace would proceed as it currently does without change.

- ***Cultural Resources.*** Fort Polk's ICRMP (Fort Polk, 2012) provides guidance and procedures to ensure all legal responsibilities for the conservation of cultural resources are being implemented. This plan also outlines procedures for consultation with the Louisiana SHPO, the Advisory Council, the USFS, Native American Indian Tribes, and other potential partners in cultural resources management. This ICRMP applies to cultural resources management on Fort Polk and on portions of the USFS LUA potentially affected by JRTC and Fort Polk mission activities. Fort Polk is currently updating the ICRMP for the period of FY 2013 to FY 2017. No significant changes have taken place since the last update that would change guidance and plan implementation components.

  Fort Polk and all USFS IUA lands have been 100 percent Phase-I surveyed and Phase-II tested. All USFS LUA lands have been 100 percent Phase-I surveyed, but Phase-II testing has not occurred at all sites; therefore, all sites potentially eligible for the NRHP are located within the LUA. A total of 3,312 archaeological sites have been identified on Fort Polk with 129 of those being eligible for the NRHP and 127 are classified as potentially eligible. All eligible sites are monitored twice per year and potentially eligible sites are monitored once per year (including those on the IUA and LUA as per the Special Use Permit Agreement with the USFS). The archaeologist monitoring the site inspects the area for signs of looting, vandalism, or other human-related or natural damages. All eligible and potentially eligible protected sites are posted with orange carsonite signs with reflective decals prohibiting driving and digging within the site boundaries.

  Fort Polk maintains and monitors a total of 19 historic cemeteries (including those on the IUA and LUA as per the Special Use Permit Agreement with the USFS). These cemeteries are routinely monitored to assess their overall conditions, as well as record

any evidence of looting or vandalism. Fort Polk contains no prehistoric or tribal cemeteries or Native American remains and burial objects. Additionally, there are no known TCPs or sacred sites on the installation.

No eligible or potentially eligible standing structures are located on Fort Polk. All World War II temporary wood buildings located on Fort Polk are addressed under the Nationwide Programmatic Memorandum of Agreement between the DoD, the ACHP, and the National Conference of SHPOs. Additionally, no World War II-era buildings have been deemed eligible for the NRHP. In 2010, an architectural survey was conducted to record and assess the eligibility of Cold War buildings on the installation. All Cold War buildings were found to be ineligible for the NRHP.

Impacts to cultural resources under the No Action Alternative would be negligible. Activities with the potential to affect cultural resources are monitored and regulated when anticipated through a variety of preventative management and minimization measures through the Fort Polk cultural resources management office.

Negligible impacts are anticipated with Alternative 1 at Fort Polk. Removal and release of temporary facilities would have no potential for adverse effects to historic buildings because there are none on the installation and very low potential to impact archeological resources. If the undertaking has the potential to affect historic properties adversely, consultation with the SHPO would occur per 36 CFR 800 as required. There is a very low potential for any unique or potentially eligible historic structures to be affected as a result of this action, and if such an action is proposed, full consultation with the SHPO would occur, as required.

Alternative 2 is anticipated to have a negligible impact to cultural resources. Measures are in place to accommodate training to prevent adverse impacts to cultural resources. The types of training conducted by the additional Soldiers would not change, though some training areas on Fort Polk might be used with marginally more frequency or intensity compared with current baseline conditions. Fort Polk CRMs would continue to follow the procedures outlined in the ICRMP in order to protect cultural resources. The increase of range usage would potentially increase the use of bivouac areas that are adjacent to ranges which could lead to an increased risk of loss of some cultural resources through small-scale ground disturbance activities. An increase in training associated with 1,000 additional Soldiers could increase use of the training areas and reduce access to cultural resource sites for monitoring and management. Overall, impacts from this alternative to cultural resources would be negligible.

- ***Noise.*** Fort Polk's acoustic environment is typically impacted by noise generating activities such as commercial air traffic, and logging operations near the post, highway and road traffic, hunting, as well as military training. The IONMP addresses these issues in a proactive manner. Elements of the IONMP include assessment of noise levels, education of the military and civilian community, management of noise complaints, mitigation of noise and vibration, the "Fly Neighborly" program, and noise abatement procedures. As a good steward, sensitive to noise complaints and annoyances, Fort Polk's Public Affairs Office maintains a Noise Hotline (337-531-1431) to receive noise complaints or other concerns about military training. The Public Affairs Office monitors the hotline daily and has a policy of responding to complaints within 24 hours.

  Principal sources of noise resulting from military training operations at JRTC and Fort Polk may include: large caliber weapons, small arms, other ordnance, fixed-wing aircraft, rotary-wing aircraft, military vehicles, and other daily operations. (USACE, 2011) The small arms ranges at Zion Hills and Peason Ridge did not need noise contours as even

.50 caliber rifle noise did not extend beyond the installation border. On a "busy" training day, noise from large caliber weapons fire and artillery extends 3,280 to 16,404 feet from the installation boundary and is categorized in a normally incompatible NZ II. NZ III, classified as incompatible, does not extend beyond the installation. Noise measurements taken by the U.S. Army Center for Health Promotion and Preventive Medicine show that the noise experienced on-post is slightly higher than the levels experienced off post.

No additional impacts from noise are anticipated under the No Action Alternative. The acoustic environment of Fort Polk would continue to be affected by small- and large-caliber weaponry, some artillery, and aircraft overflight. Other activities, such as ground maneuver training and exercises resulting in noise created by personnel and vehicles, would continue to contribute noise on and around Fort Polk, to the same levels and intensity as historically experienced.

Impacts from noise are anticipated to be negligible as a result of the implementation of Alternative 1. Existing ranges would still be utilized for firing the same types of weapons systems and conducting the same types of training. Under Alternative 1, however, Fort Polk would have a negligible anticipated reduction in the frequency of noise generating training events. The operations of the JRTC would continue to be the major generator of training related noise. The number of weapons qualifications and maneuver training events could be anticipated to decrease slightly. Noise impacts would likely remain comparable to current conditions. The current frequency of aviation training activities, a contributor of noise at the installation, would not be anticipated to change more than marginally, as aviation units would not be impacted by these decisions.

There would be a negligible impact on the installation and surrounding communities by the addition of up to 1,000 Combat/Combat Support Soldiers. The most prevalent sources of new noise would be from small arms weapons fire and some maneuver; which, when compared to the current training of the JRTC environment, is largely insignificant.

Given that there are no new types of activities that would occur as a result of stationing of these Soldiers, just a slight increase in the types of existing noise generating activities, only minor impacts are anticipated to occur as a result of implementing this alternative. Sensitive wildlife populations would not be impacted by the implementation of Alternative 2. Wildlife in the area is noise-tolerant, having become habituated to noise in the current training environment. Noise from simulated Artillery rounds and .50 caliber blank weapons fire and small arms fire has not been shown to impact RCW nesting or reproductive success, even for those inhabiting direct fire ranges and impact areas (Delaney et. al., 2002).

- ***Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species).*** Historically, most of Fort Polk's natural resource management efforts had focused on single species management, but the overall strategy has shifted to focus on maintenance of natural ecosystem functionality. Fort Polk's INRMP (Fort Polk, 2004) uses an ecosystem management approach, seeking to manage natural resources at a landscape scale with a focus on habitat rather than single-species management. The primary objective is to support the military mission with sustainable and realistic training land, while promoting ecological health and diversity.

  Fort Polk's wildlife species include most animals indigenous to the southwestern Louisiana pinelands region. A total of 224 species of birds, 70 species of reptiles and amphibians, 45 species of mammals, 35 species of fish, 12 species of freshwater mussels, and 13 vegetation community types have been recorded as occurring on the

installation. Fort Pork has one endangered species, the RCW (*Picoidies borealis*) managed under Fort Polk Endangered Species Management Component (ESMC, 2011). One candidate species, the Louisiana Pine Snake (*Pituophis ruthveni*), is being considered for listing under the ESA, but currently receives no federal protection. Fort Polk manages the Louisiana Pine Snake via a Candidate Conservation Agreement with the USFWS, USFS, Texas Parks and Wildlife Department, and the Louisiana Department of Wildlife and Fisheries. The Louisiana Pine Snake is found in both East Texas and Western Louisiana.

Negligible adverse effects would occur at Fort Polk under the No Action Alternative. Fort Polk would continue to adhere to its existing resource management plans and INRMP to further minimize and monitor any potential effects. Units are briefed prior to each training event regarding sensitive areas on-post, such as protected species habitat, and what is and is not allowed within certain areas.

Negligible impacts to biological resources are anticipated as part of the implementation of Alternative 1. Scheduling conflicts for training area access to conduct resource monitoring would be reduced. Proactive conservation management practices and species monitoring would be more easily accomplished with reduced mission throughput. As a result of this alternative, maneuver and live-fire training reductions would decrease the chance for impacts to vegetation and wildlife.

Negligible adverse impacts are anticipated as part of the implementation of Alternative 2. The increase in this number of Soldiers would increase training by less than 10 percent above the current training levels. While this moderate force augmentation would increase maneuver traffic in the training lands and ranges, it would not cause significant degradation or destruction of threatened or endangered species or rare species habitats. Access to training lands and ranges for the purpose of threatened and endangered species monitoring and habitat management would become slightly reduced as natural resource management cannot be conducted during training events. Management hours would increase by Fort Polk staff, however, when access to management areas was possible to compensate for this more limited access. Fort Polk staff would still implement the requirements outlined in natural resource management plans and the ESMC. It is not anticipated that implementation of this level of Soldier growth would have more than negligible impacts on the listed or candidate species found on the installation.

The endangered and candidate species recorded on the installation would continue to be managed in accordance with the installation's INRMP and ESMC, terms and conditions identified within Biological Opinion(s) issued by the USFWS, and any conservation measures identified in ESA, Section 7 consultation documents.

- ***Energy Demand and Generation.*** The existing electrical system on the JRTC and Fort Polk is divided into two distribution systems that serve the two distinct cantonment areas of the installation. Each system is supplied by its own substation, through Entergy electric utility.

The natural gas system at the JRTC and Fort Polk was installed in 1942 and has served the majority of the installation's heating, domestic hot water, and institutional services (cooking, laundry, and the like) and some cooling requirements since its installation. Two commercial gas companies using separate transmission lines provide natural gas to South and North Fort Polk. Current supplies of natural gas are considered adequate based on the fact that the current 8-inch transmission line, which feeds the JRTC and Fort Polk, could deliver in excess of 400,000 thousand cubic feet per year, which far exceeds historic demand levels.

Negligible impacts would result from the No Action Alternative and Alternative 2. As a result of the implementation of Alternative 1, a minor beneficial impact is anticipated. Regardless of the alternative selected, energy would be available to support Fort Polk operations without the need for additional power infrastructure. A reduction in Soldier numbers would decrease energy requirements and usage on-post.

Fort Polk anticipates that the implementation of any of the alternatives would result in negligible impacts for those VECs discussed above. The following provides a discussion of the VECs requiring a more detailed analysis, as they are anticipated to have the potential of a higher level of impact as a result of the implementation of the Proposed Action alternatives.

4.16.2 Air Quality

4.16.2.1 Affected Environment

The JRTC and Fort Polk is located in AQCR 106 and 022. The ROI for air quality affected is defined as AQCRs 106 and 022. The JRTC and Fort Polk is primarily in Vernon Parish, with small portions of the post (Peason Ridge Training Area) extending into Sabine and Natchitoches parishes. England Industrial Airpark, Fort Polk's primary departure and return point for deploying units, is located in Rapides Parish (AQCR 106). Air quality in all four parishes meets or exceeds the NAAQS as established by EPA; therefore, these areas are considered attainment areas.

Fort Polk is designated as a major stationary source of air pollutants and operates under a CAA Title V Operating Permit. Under the Title V Operating Permit, permitted stationary sources include gasoline and JP8 (jet fuel) storage, fueling and dispensing facilities, paint booths, generators, boilers, wastewater treatment facilities, degreasing operations, solvent reclamation, munitions detonation, and engine testing.

In addition to stationary sources, air pollutants are generated at the JRTC and Fort Polk by activities such as fugitive dust from training vehicles, exhaust emissions from training vehicles, aircraft engine emissions, decomposition products of propellants, obscurants, pyrotechnics, explosives, and emissions from prescribed burning and wildfires. In 1989, Fort Polk received an exemption for air emissions resulting from fugitive dust from vehicles, smoke from obscurant burning fog oil and decomposition, and in-place detonation of small explosives associated with training exercises conducted within the boundaries of the military reservation and Peason Ridge training. This exemption is still in effect for Fort Polk. Although air quality standards may be exceeded locally at source points within the installation boundary during training events, the events do not cause exceedances or visual obstructions outside JRTC and Fort Polk.

4.16.2.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would continue to be negligible short- and long-term fugitive dust and emissions impacts from training and installation operations. These impacts would not exceed threshold levels. Permit conditions would continue to be monitored and met, but no changes to emission sources are anticipated, other than those mandated by maintenance, replacement, or elimination of sources as they age or are removed from service.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to regional air quality from reduced stationary and mobile emission sources. There would be less combustion and generation of NAAQS pollutants and HAPs associated with military training and less emissions generation by Soldiers and their dependents in the cantonment area. In addition, there would be less fugitive dust generated from fewer training events.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be an anticipated minor impact on air quality in the airsheds surrounding Fort Polk as a result of implementing Alternative 2. There would be an anticipated minor increase in air emissions from both mobile and stationary sources that would be generated to support additional Soldiers and their Families. Fort Polk can anticipate increased emissions from military vehicles, POVs, and generators used to support training events as well as increase in fugitive dust. The increase of up to 1,000 Soldiers and their dependents would have only minor impacts to regional air quality. Fort Polk would not exceed the emissions limits of its Title V permit or to engage in activities causing any change in attainment status or exceedance of NAAQs. Activities that generate air emissions would not qualitatively change though they could be anticipated to increase marginally to support additional Soldiers.

4.16.3 Soil Erosion

4.16.3.1 Affected Environment

Fort Polk is located in the Coastal Plain province and is characterized by a rolling topography, moderately to heavily covered with second-growth timber. Local relief is generally less than 100 feet while the terrain at Peason Ridge (northwest portion of installation) is low, well-rounded hills of less than 500 feet.

Soils on the installation are derived from in-place weathering of underlying rock strata, except in the floodplains of water bodies, where soils consist of alluvial silts and sands. In general, most soils in the study area are highly weathered and acidic and have low fertility. Six predominant soil associations comprise the soils occurring on the installation. The majority of Fort Polk is mantled with a fine-grained silty sand topsoil. The Natural Resources Conservation Service classifies the Fort Polk soils such as the thick layer of sand, clay, and alluvium as highly erodible (USDA, 2002).

Fort Polk has established programs and procedures to minimize soil erosion on its training lands. The following measures are currently implemented installation wide and would be used to maintain and sustain the training lands associated with the Proposed Action. The following describes existing procedures and programs utilized to decrease soil displacement and thereby protect waterways from sedimentation.

- ***Installation Training Area Management Program.*** The JRTC and Fort Polk's ITAM program and the LRAM program are used to identify and repair land that requires rehabilitation.
- ***Maneuver Damage Inspection and Monitoring.*** The JRTC and Fort Polk's maneuver damage inspection and repair program is being expanded to include identification, repair, and monitoring for damages from routine home station training events. All training lands would be inspected for maneuver damage to soils, vegetation, streams and wetlands, and sensitive environmental resources following each training exercise, and corrective actions would be initiated.
- ***Annual Maintenance of Sediment Basins.*** All sediment basins would be inspected to ensure that they are functioning properly. Basin maintenance would be prioritized according to need. Excess sediment would be removed from basins, applied to upland areas, and stabilized.
- ***Temporary Closure of Sites.*** Maneuver damage inspectors would identify sites on the installation needing protection to facilitate recovery from maneuver damage to soils, vegetation, streams and wetlands, and sensitive environmental resources. Sites would

be marked as temporarily off-limits to digging and driving until the sites are recovered. Closed areas would be added quarterly or as needed to the "No Dig/No Drive" map used to help military trainers for planning purposes.

- ***Integration of Maneuver Damage Inspection and Repair into Annual Training Calendar.*** Sufficient time on the Annual Training Calendar would be scheduled for maneuver damage inspection and repair following all training events. Updated protocols for scheduling of maneuver damage inspections, repairs, and other resource management needs on Army lands would be incorporated into JRTC and Fort Polk Regulation 350-10. These protocols would provide enhanced opportunities for damage inspection, corrective actions, and monitoring.
- ***Scheduling of Non-Training Activities.*** Non-training activities such as LRAM; prescribed burning, forest thinning and other forest management activities; and maneuver damage repair would be scheduled at the monthly Resource Allocation Conferences. This would ensure that damage repair and forest management would receive top priority during the Green Period (14 uninterrupted days each quarter during which environmental management and stewardship measures are given priority on land utilization) and that restoration and maintenance activities would occur according to schedule. Changes to the existing installation protocols for scheduling of non-training activities would be incorporated into JRTC and Fort Polk Regulation 350.

4.16.3.2 Environmental Consequences

No Action Alternative

Minor adverse impacts are anticipated under the No Action Alternative. Fort Polk would continue its infantry and mechanized training, to include impacts to soils from removal of or damage to vegetation, digging activities, ground disturbance from vehicles, and ammunition or explosives used in training events. The installation's ITAM program conducts monitoring, rehabilitation, and maintenance and repair on areas of high use such as drop zones, artillery firing positions, observation points, and ranges.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Impacts from soil erosion are anticipated to be negligible as a result of the implementation of Alternative 1. Alternative 1 includes the reduction of no-longer-needed facilities that could result in short-term adverse impacts from demolition and temporary exposure of bare soils to rain and water and wind erosion; however, these impacts would be short term in duration. Overall, there would be anticipated negligible long-term impacts from reduced training and more opportunities for land rehabilitation and natural rest and recovery of the landscape. It is anticipated that there would be less soil erosion and sedimentation attributable to training activities. With the continued implementation of the above programs short- and long-term negligible adverse impacts to soils are anticipated. A decrease in foot and vehicular traffic would result in minimal beneficial impacts to areas along roadways and trails on the installation. As a result of the implementation of Alternative 1, off-road movement would not impact soil erodibility based on disturbance to vegetation and soil surfaces, and rainfall intensity.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

With the continued implementation of the above programs short- and long-term minor adverse impacts to soils are anticipated. Training of additional Soldiers and units would occur in Fort Polk's existing training areas. The stationing of additional Soldiers at Fort Polk would result in only a slight increase in maneuver training, as a majority of maneuver training and soils impacts

are caused by the JRTC unit training. Fort Polk would continue to implement the ITAM program and its environmental programs to protect soils. Impacts to soils would therefore be minor.

4.16.4 Wetlands

4.16.4.1 Affected Environment

Wetlands occurring on Fort Polk can be associated with palustrine forested wetlands or bottomlands not capable of supporting pine dominated forests. Wetlands also consist of freshwater bogs, baygalls, and swamps. For most of the year, bogs are saturated and they exist in locations where the water table is near the surface.

In addition to pitcher plant bogs, surface water and wetland areas on Fort Polk include 100 acres of manmade impoundments, 50 acres of beaver ponds, and 8,800 acres of riparian areas. Together, wetlands make up about 6.5 percent of Fort Polk and are typically widely scattered (Fort Polk, 2004).

4.16.4.2 Environmental Consequences

No Action Alternative

Negligible adverse impacts would continue. Fort Polk would continue monitoring its wetlands and sediment basins to contain soil erosion and potential degradation of wetland function caused by training. Fort Polk would continue to rest and recover heavily used training areas to limit sedimentation impacts to wetlands and surface waters, and Fort Polk would continue to monitor its wetlands areas.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Impacts from soil erosion are anticipated to be negligible and potentially beneficial. Alternative 1 includes the reduction of no longer needed facilities that could result in short-term adverse impacts from demolition and temporary exposure of bare soils to rain and water and wind erosion; however, these impacts would be short term in duration. Overall, there would be anticipated negligible long-term impacts from reduced training and more opportunities for land rehabilitation and natural rest and recovery of the landscape. It is anticipated that there would be less soil erosion and sedimentation attributable to training activities; however, these effects would be negligible, as the JRTC uses most of the land at Fort Polk for much of the year, and its operations would continue at a high operations tempo.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There is anticipated to be short- and long-term minor adverse impacts on wetlands. The installation would continue to implement programs to limit the potential for impacts to wetlands to include avoidance of wetland areas as part of installation range operations. Additional training activities would have minor impacts on wetland areas which could experience limited increased impacts from sedimentation and maneuver training.

4.16.5 Water Resources

4.16.5.1 Affected Environment

***Watersheds*.** The main post lies within three major watersheds: the Lower Sabine River basin, Whiskey-Chitto River basin, and Upper Calcasieu River basin. Three watersheds, the Lower Sabine, the Upper Calcasieu, and the Lower Red-Lake, contain water bodies listed as impaired in 2002. TMDLs would be established for the pollutants of concern within these impaired water bodies.

The headwaters of many streams lie within the installation's boundaries. Five streams are either headwaters or tributaries to streams or rivers designated under the Natural and Scenic River System and are located within the watersheds of the JRTC and Fort Polk military installation.

Groundwater. Groundwater is the principal source of drinking water for the JRTC and Fort Polk and Vernon Parish. The Williamson Creek, Carnahan, and Evangeline aquifers support water supply wells in the area of the JRTC and Fort Polk. The Evangeline aquifer is also the source of groundwater to the public-supply wells for the Town of Pitkin, 5 miles south of the installation, and to domestic wells in the southern part of Vernon Parish. The Williamson Creek aquifer is the source of groundwater for public supply wells in the Town of Pickering. The Carnahan Bayou aquifer is also a source of groundwater for public supply wells in the towns of Leesville and Simpson.

Water Supply. Water for South Fort Polk is supplied entirely by wells situated throughout the South Fort Polk area. These wells have a combined maximum capacity of approximately 7.8 mgd. A sustainable daily yield for these water wells is approximately 5.2 mgd. The South Fort Polk distribution system is generally in good condition and can be anticipated to provide sufficient quantities and pressures for domestic and fire flow requirements under baseline and projected populations.

Water for North Fort Polk is supplied entirely by wells situated throughout the North Fort Polk area. These wells have a combined maximum capacity of approximately 4.2 mgd. A sustainable daily yield for these water wells is approximately 3.5 mgd. The North Fort Polk distribution system is also in good condition and can be anticipated to provide sufficient quantities and pressures for domestic and fire flow requirements under baseline and projected populations.

In total, Fort Polk uses less than 1.5 mgd, and has plenty of water availability from its wells to support current and increased levels of Soldier stationing.

Wastewater. The JRTC and Fort Polk operates two WWTPs: the North Fort WWTP, with a design flow of 1.4 mgd, and the South Fort WWTP, with a design flow of 3.8 mgd. The JRTC and Fort Polk also operates three other wastewater treatment systems (Peason Ridge, Toledo Bend, and the Landfarm Pond). Each of these systems is relatively small and has design flows of less than 25,000 gpd.

The average daily combined wastewater discharge from both the North Fort WWTP and the South Fort WWTP has ranged from just below 2 mgd in 1995, to 3.5 mgd in 1992. Since 1992, the amount of wastewater discharged from the installation has declined significantly, primarily because of a decrease in population of more than 17,000 people and a decrease of approximately 1 million square feet in real property resulting from the transfer of the 5th Infantry Division from Fort Polk to Fort Hood. Average daily discharges in 2000 at the North Fort WWTP and the South Fort WWTP were 0.344 mgd and 1.74 mgd, respectively.

The Peason Ridge Sanitary Sewage Treatment Facility supports the sanitary sewage treatment requirements of the Peason Ridge Cantonment Area and the JRTC at the Peason Ridge Training Area. The treatment facility is a lagoon system capable of processing 2,400 gpd of sewage and a peak flow of 3.0 gpm.

Stormwater. Industrial activities, including such transportation-related activities as vehicle maintenance, fueling, and washing, are currently permitted under the NPDES Industrial Activities permit program. The installation also obtains permits for construction activities disturbing more than 1 acre. Fort Polk also has permit coverage for its MS4.

4.16.5.2 Environmental Consequences

No Action Alternative

The No Action Alternative would have negligible adverse effects to water resources. No change from existing conditions would occur and all construction, operation, and maintenance projects already under way have obtained the NPDES permit and other applicable permits and are operating in adherence to their guidance. Training activities would continue as would environmental management activities with minimal adverse impacts to surface waters.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Minor beneficial impacts are anticipated as part of the implementation of Alternative 1. A loss of up to 5,300 Soldiers and Army civilian employees would reduce training area use, and decrease the chance of potential surface water impacts. The demand for potable water would also be diminished, and implementation of Alternative 1 would create additional treated wastewater capacity for other uses at the installation. Water demands and wastewater treatment would decrease, but Fort Polk's water supply and water and wastewater infrastructure capacities would remain adequate. The decrease in wastewater generation could potentially negatively affect Fort Polk's WWTP due to the reduction of wastewater volumes and lack of adequate influx of wastewater to maintain transmission lines and treatment. This issue would require further study if Alternative 1 were selected at Fort Polk to determine the impacts to the WWTPs.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Overall, minor impacts are anticipated as part of the implementation of Alternative 2. Any new construction and land disturbance over 1 acre would require a stormwater construction permit, which would entail identification and implementation of mitigation strategies to reduce impacts associated with stormwater runoff during and after construction. Based on the average of 100 gpd of potable water use per person it is anticipated that 1,000 additional Soldiers would increase potable water demand by approximately 100,000 gpd. Dependents accompanying these Soldiers could increase water demand by an additional estimated 152,000 gpd, though some dependents would live off post where water would come from other sources. The demand created by this increase in personnel is easily met and would not adversely impact Fort Polk's water supply. Fort Polk currently has plenty of extra capacity, with regard to potable water, to accommodate the increase of Soldiers and dependents. Based on an average daily use of 109 gpd per person, it is anticipated that wastewater would increase by 109,000 gpd, well within the permitted limits and capacity of the WWTPs, even when considering the potential increase in the numbers of Family members and dependents, who could add another 166,000 gpd in treatment requirements to the total amount of wastewater requiring treatment on Fort Polk.

4.16.6 Facilities

4.16.6.1 Affected Environment

The JRTC and Fort Polk consists of three general land use categories: the cantonment area, training areas, and impact areas. The cantonment area of Fort Polk consists of about 8,050 acres in the western portion of the installation and consists of administration, billeting, and Family housing areas. It has been developed into a wide variety of land uses that comprise the elements necessary for a complete community. This includes the installation Post Exchange, commissary, housing and Family support services, medical, and mission-support facilities.

4.16.6.2 Environmental Consequences

No Action Alternative

Impacts to facilities would be negligible under the No Action Alternative. The installation would continue to utilize its existing facilities to meet the needs of its Soldiers.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Minor beneficial impacts are anticipated as a result of the implementation of Alternative 1. An increase in the FRP and facilities demolition at Fort Polk would occur as a result of this alternative. Older, less-efficient facilities nearing the end of their life-cycle would be demolished when no longer needed to support Soldiers or their Families and would allow the Army to save on maintenance and energy requirements. Facility usage and availability would increase for the installation's remaining population, allowing some facilities to be re-used and some units to obtain better permanent facilities to meet their needs.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be less than significant impacts to facilities as a result of the implementation of Alternative 2. Increased Soldier strength of up to 1,000 Soldiers would be reflected through increased usage throughout the cantonment area. Although the total number of facilities available meets Fort Polk's requirements, many unit operations facilities are outdated and smaller than the standard facilities authorization for Army units. If new facilities were not constructed for additional units stationed at Fort Polk, existing facilities could be provided, but these would be smaller and older buildings. Activities within the training and range areas would be limited to existing firing ranges, maneuver areas, and roadways.

The impacts of the Proposed Action and other alternatives on utilities and communications would not exceed the capacity of the installations current infrastructure.

4.16.7 Socioeconomics

4.16.7.1 Affected Environment

Fort Polk main post is located in Vernon Parish, approximately 7 miles east of Leesville, Louisiana and 20 miles north of DeRidder, Louisiana. Peason Ridge is located in Sabine, Natchitoches, and Vernon parishes. The ROI is the area that the demographic, economic, and social effects of the Proposed Action are most likely to influence. The ROI includes nearby trade and service centers related both directly and indirectly to the economic activities of the JRTC and Fort Polk. It takes into account the residency distribution of the JRTC and Fort Polk military and civilian personnel, as well as the parishes within commuting distance of the post and use of lands by the JRTC and Fort Polk for training and deployment. For purposes of this analysis, the ROI consists of Beauregard, Natchitoches, Rapides, Sabine, and Vernon parishes.

Population and Demographics. The Fort Polk population is measured in three different ways. The daily working population is 10,836, and consists of full-time Soldiers and government Army civilian employees working on post. The population that lives on Fort Polk consists of 3,298 Soldiers and 6,847 dependents, for an estimated total on-post resident population of 10,145. Finally, the portion of the ROI population related to Fort Polk is 18,996 and consists of Soldiers, civilian employees, and their dependents living off post.

Population data from the U.S. Census Bureau (U.S. Census, 2010) were used to determine current population numbers for the ROI for Fort Polk. Table 4.16-3 provides a summary of the demographic characteristics of Beauregard, Natchitoches, Rapides, Sabine, and Vernon parishes in Louisiana. The ROI parish population is over 284,000. Compared to 2000, the 2010

population increased in Beauregard, Rapides, and Sabine parishes, and the State of Louisiana. Population decreased in Natchitoches and Vernon parishes (Table 4.16-3). The racial and ethnic composition of the ROI is presented in Table 4.16-4.

Table 4.16-3. Population and Demographics

Region of Influence Counties	Population 2010	Population Change 2000-2010 (Percent)
Louisiana	4,600,000	+ 0.9
Beauregard	36,000	+ 1.3
Rapides	132,000	+ 0.6
Natchitoches	40,000	- 0.3
Sabine	24,000	+ 1.2
Vernon	52,000	- 0.4

Table 4.16-4. Racial and Ethnic Composition

State and Region of Influence Counties	Caucasian (Percent)	African American (Percent)	American Indian (Percent)	Asian (Percent)	Hispanic (Percent)	Two or More Races (Percent)
Louisiana	60	32	4	1	4	1
Beauregard	80	14	1	1	3	2
Rapides	62	32	1	1	3	1
Natchitoches	54	42	0	1	2	1
Sabine	69	17	9	0	3	2
Vernon	71	15	2	2	8	2

Employment, Income, and Housing. Compared to 2000, the 2009 employment (private nonfarm) increased the State of Louisiana and Beauregard, Rapides, Natchitoches, and Vernon parishes. Employment decreased in Sabine Parish (Table 4.16-5). Employment, median home value and household income, and poverty levels are presented in Table 4.16-5.

Table 4.16-5. Employment, Housing, and Income

State and Region of Influence Counties	2009 Total Nonfarm Employment (Employees)	Employment Change 2000-2009 (Percent)	Median Home Value 2005-2009 (Dollars)	Median Household Income 2009 (Dollars)	Population Below Poverty Level 2009 (Percent)
Louisiana	1,639,104	+ 2.9	130,000	43,445	18.1
Beauregard	6,877	+ 4.9	83,400	45,202	13.2
Rapides	49,277	+ 2.1	110,500	40,658	18.1
Natchitoches	10,631	+ 4.9	90,500	30,326	28.6
Sabine	4,176	- 8.0	74,600	35,395	20.7
Vernon	8,785	+ 18.8	85,400	42,554	15.0

- **Beauregard Parish**

  According to the U.S. Census Bureau (U.S. Census, 2010) information, 26.9 percent of working residents in Beauregard Parish are in management/professional and related

occupations. Sales and office occupations follow at 21.3 percent (U.S. Census, 2010). Of the working population in Beauregard Parish, construction, extraction, and maintenance occupations employ 21.7 percent; 5.8 percent are in production, transportation, and material moving occupations; and 5.4 percent are in farming, fishing, and forestry occupations. The educational, health, and social services industry employs 20.0 percent of the working population in the study area. The manufacturing industry employs 11.4 percent of the working population. The retail trade industry employs 10.8 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 5.8 percent of the working population. The construction industry employs 10.3 percent of the working population and the arts, entertainment, recreation, accommodation, and food services industry employs 7.3 percent. Other services, transportation and warehousing/utilities industries employ 5.8 percent. The remaining 17.4 percent are employed by the wholesale trade; finance and insurance, and real estate and rental and leasing; and information industries.

Major employers in the ROI include Amerisafe, Inc, Ampacet Corporation, Beauregard Electric Co-Op, Inc, Beauregard memorial Hospital, Boise Packaging & Newsprint, Mead Wesvaco Corporation, Merryville Nursing Center, Wal-Mart Supercenter and Westwood Manor (Louisiana Site Selection, 2009).

- **Natchitoches Parish**

Working residents (27.5 percent) in Natchitoches Parish are in management and professional and related occupations. Sales and office occupations follow at 23.3 percent (U.S. Census, 2010). Of the working population in Natchitoches Parish, construction, extraction, and maintenance occupations employ 6.7 percent; 14.8 percent are in production, transportation, and material moving occupations; and 5.9 percent are in farming, fishing, and forestry occupations. The educational, health, and social assistance industry employs 26.5 percent of the working population in the study area. The manufacturing industry employs 12.9 percent of the working population. The retail trade industry employs 12.1 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 6.3 percent of the working population. The construction industry employs 6.7 percent of the working population and the arts, entertainment, recreation, accommodation, and food services industry employs 8.3 percent. Other services, transportation and warehousing and utilities industries employ 4.7 percent. The remaining 4.2 percent are employed by the wholesale trade; finance and insurance, and real estate and rental and leasing; and information industries.

Major non-governmental employers in the ROI include Pilgrim's Pride, Roy O Martin, Alliance Compressors, and Natchitoches Regional Medical Center. Government employers include Parish of Natchitoches, Natchitoches Parish School Board and Northwestern State University (Louisiana Site Selection, 2009).

- **Rapides Parish**

Working residents (32.5 percent) in Rapides Parish are in management and professional and related occupations. Sales and office occupations follow at 24.8 percent (U.S. Census, 2010). Of the working population in Rapides Parish, construction, extraction, and maintenance occupations employ 14.6 percent; 11.3 percent are in production, transportation, and material moving occupations; and 3.1 percent are in farming, fishing, and forestry occupations. The educational, health, and social assistance industry employs 30.4 percent of the working population in the study area. The manufacturing industry employs 7.3 percent of the working population. The retail trade industry employs

12.6 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 6.9 percent of the working population. The construction industry employs 7.2 percent of the working population and the arts, entertainment, recreation, accommodation, and food services industry employs 6.7 percent. Other services, transportation and warehousing and utilities industries employ 5.0 percent, respectively. The remaining 3.4 percent are employed by the wholesale trade; finance and insurance, and real estate and rental and leasing; and information industries.

Major non-government employers in the ROI include Christus St. Frances Cabrini Hospital, Cleco Corporation, Dresser Consolidated Valves, Gilchrist Construction Company, International Paper, Interstate Bakeries, Procter and Gamble, Rapides Regional Medical Center, Saint Mary's Training Facility and UTLX Manufacturing. Major government employers include City of Alexandria, City of Pineville, Louisiana State University at Alexandria, Pinecrest Supports and Services Center, Rapides Parish School Board and Rapides Parish Sheriff's office (Louisiana Site Selection, 2009).

- **Sabine Parish**

In Sabine Parish, approximately 24.7 percent of working residents in the parish are in management and professional and related occupations. Sales and office occupations follow at 20.1 percent and service occupations at 16.4 percent (U.S. Census, 2010). Of the working population in Sabine Parish, construction, extraction, and maintenance occupations employ 18.1 percent; 17.5 percent are in production, transportation, and material moving occupations; and 15.5 percent are in farming, fishing, and forestry occupations. The educational, health, and social services industry employs 22.3 percent of the working population in the study area. The Public Administration industry employs 4.3 percent of the working population. The retail trade industry employs 10.7 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 4.8 percent of the working population. The construction industry employs 7.4 percent of the working population and the arts, entertainment, recreation, accommodation, and food services industry employs 4.8 percent. Other services, manufacturing, transportation and warehousing/utilities industries employ 10.7 percent, 2.2 percent, and 5.1 percent, respectively. The remaining 18.7 percent are employed by the wholesale trade; finance and insurance, and real estate and rental and leasing; and information industries. In 2010, Sabine Parish's unemployment rate (civilian labor force) was 7.9 percent.

Major employers in the ROI include Boise Cascade, Smurfit-Stone Container Corporation, Many Healthcare North, Sabine Bancshares, Sabine Medical Center, and Sabine Retirement and Rehab Center (Louisiana Site Selection, 2009).

- **Vernon Parish**

In Vernon Parish, approximately 27.6 percent of working residents in the parish are in management/professional and related occupations. Sales and office occupations follow at 24.7 percent and service occupations at 19.6 percent (U.S. Census, 2010). Of the working population in Vernon Parish, construction, extraction, and maintenance occupations employ 9.2 percent; 22.3 percent are in production, transportation, and material moving occupations; and 4.8 percent are in farming, fishing, and forestry occupations. The educational, health, and social services industry employs 22.0 percent of the working population in the study area. The public administration industry employs 13.60 percent of the working population. The retail trade industry employs 13.1 percent of the working population. Professional, scientific, management, administrative, and waste management services industries employ 8.2 percent of the working population.

The construction industry employs 8.0 percent of the working population and the arts, entertainment, recreation, accommodation, and food services industry employs 8.2 percent. Other services, manufacturing, transportation and warehousing/utilities industries employ 12.0 percent. The remaining 6.4 percent are employed by the wholesale trade; finance and insurance, and real estate and rental and leasing; and information industries. In 2010, the Vernon Parish's unemployment rate (civilian labor force) was 7.7.

Major employers in the ROI include Fort Polk/JRTC, Vernon Parish School Board, and Wal-Mart Supercenter, Byrd Regional Hospital, Vernon Parish Police Jury, Vernon Parish Sheriff's Dept, Leesville State School, and the City of Leesville (Louisiana Site Selection, 2009).

Fort Polk is the largest employer in west central Louisiana with more than 6,600 civilian employees (to include contractor personnel). Additionally, it is estimated that Fort Polk contributes $1.3 billion to the local area economy each year (Fort Polk Real Property Digest, 2008).

Housing. Fort Polk is participating in the RCI, under which private builders build, own, and manage Family housing on the installation. Fort Polk, under the RCI housing program is authorized a maximum of 3,821 housing units. At any given time, approximately 95 percent of the total number of housing units is available for occupancy. The remaining 5 percent are undergoing renovations to prepare the units for their next occupants. Family housing on Fort Polk is effectively full (Fort Polk, 2010).

Fort Polk has Family quarters totaling 3,578. An estimated 6,847 military Family members reside on post and an estimated 11,297 reside off post. Barracks spaces for unaccompanied personnel total to 4,002. Fort Polk is constructing 240 spaces that would meet these standards. Additionally, 524 barracks spaces have been renovated at Fort Polk to accommodate one Soldier to a one room space.

Schools. Children of military personnel attend school within two parishes in the ROI. Fort Polk accounts for 34 percent of students attending 19 schools in Vernon Parish and 12 percent of the students attend 12 schools in Beauregard Parish. A total of 4,146 military-dependent students attend schools in both parishes; these local schools receive approximately $5,950,000 in federal funding.

Public Health and Safety

Police. The Fort Polk Police Department, a part of the Directorate of Emergency Services, provides law enforcement and property protection at Fort Polk. Police functions include protecting life and property, enforcing criminal law, conducting investigations, regulating traffic, providing crowd control, and performing other public safety duties. City, county, and state police departments provide law enforcement in the ROI.

Fire. The Fort Polk Fire Department, a part of the Directorate of Emergency Services, provides emergency firefighting and rescue services at Fort Polk. Fire prevention is another service provided by the Fort Polk Fire Department. Fire prevention activities include providing fire safety advice and ensuring that structures are equipped with adequate fire precautions to ensure that in the event of fire, people can safely evacuate the premises unharmed.

Medical. Fort Polk supports a range of medical services. The Bayne Jones Army Community Hospital (BJACH) provides healthcare services for military personnel, military dependents, and to military retirees and their dependents. BJACH services include audiology/speech pathology, dermatology, dietetics, emergency services, family medicine, internal medicine, OB/GYN, occupational therapy, ophthalmology, optometry, orthopedics, otolaryngology, pediatrics,

physical therapy, psychiatry, surgery, podiatry, psychology, social work, and substance abuse. Fort Polk also provides dental services and supports a Warrior Transition Battalion.

Family Support Services. The Fort Polk DFMWR and ACS provide programs, activities, facilities, services, and information to support Soldiers and Families. Services provided at Fort Polk include child care, youth programs, deployment readiness for Families, employment readiness, financial readiness, relocation readiness, exceptional family member support, Warrior in Transition support, and survivor outreach.

Recreation Facilities. Fort Polk facilities or programs for recreation include fitness centers, swimming pools, athletic fields, golf course, splash park, recreational shooting range, bowling center, outdoor recreation opportunities, sports teams, and a Warrior Zone.

4.16.7.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in negligible effects to existing socioeconomic resources. Fort Polk would continue to support operations of the local community and have beneficial economic impact on the region. No additional impacts to housing, public and social services, public schools, public safety, or recreational activities are anticipated.

Alternative 1: Force Reduction (up to 5,300[1] Soldiers and Army Civilians)

Economic Impacts. Alternative 1 would result in the loss of approximately 5,300 Soldier and Army government civilian (military employee) positions, each with an average annual income of $41,830. In addition, this alternative would affect an estimated 2,924 spouses and 5,103 dependent children for a total estimated potential impact to 13,343 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 13,343 military employees and their dependents.

Based on the EIFS analysis, there would be no significant impacts for sales volume or income. There would be significant impacts for employment and population. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.16-6. Table 4.16-7 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.16-6. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	8.90	7.17	5.1	3.43
Economic Contraction Significance Value	- 9.28	- 7.71	- 5.15	- 2.42
Forecast Value	- 4.31	- 4.30	- 7.53	- 4.70

1 Calculations used a number of 5,316 Soldiers and civilians for estimating socioeconomic impacts. This number was derived by assuming the loss of the 4/10 IBCT (roughly 3,450 Soldiers), 30 percent of the installation's other Combat Support Soldiers not associated with the BCT, and up to 15 percent of the civilian workforce. As discussed in Chapter 3, this number is rounded to the nearest hundred personnel when discussing impacts of Alternative 1.

Table 4.16-7. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$283,806,400	$255,733,300	- 5,893 (Direct) - 928 (Indirect) - 6,821 (Total)	- 13,343
Percent	- 4.31 (Annual Sales)	- 4.30	- 7.53	- 4.70

The total annual loss in direct and indirect sales in the ROI represents an estimated -4.31 percent change from the current total sales volume of $6.58 billion within the ROI. State tax revenues would decrease by approximately $11.35 million as a result of the loss in revenue from sales reductions. Some parishes within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be lost at the parish and local level. Regional income would decrease by 4.30 percent. While approximately 5,300 Soldier and Army government civilian positions would be lost within the ROI, EIFS estimates another 577 military contract service jobs would be lost as a result of the implementation of Alternative 1, and an additional 928 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in employment would be -6,821 jobs, or a -7.53 percent change in regional non-farm employment. The total number of employed positions (non-farm) in the ROI is estimated to be approximately 90,600. A significant population reduction of 4.70 percent within the ROI is anticipated as a result of this alternative. Of the approximately 284,000 people (including those residing on Fort Polk) that live within the ROI, 13,343 military employees and their dependents would no longer reside in the area following the implementation of Alternative 1. This would lead to a decrease in demand for housing, and increased housing availability in the region. This could lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes civilian and military employees and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.16-8 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.16-8. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $180,744,596 (Local) - $319,050,290 (State)	$246,004,278	5,714 (Direct) 494 (Indirect) 6,208 (Total)
Percent	- 2.75	- 4.13	- 6.85

The total annual loss in direct and indirect sales in the ROI represents an estimated -2.75 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 1.56 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales

volume numbers presented in the RECONS model, it is anticipated that state tax revenues would decrease by approximately $12.76 million as a result of the loss in revenue from sales reductions, which would be $1.41 million less in lost state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to decrease by 4.13 percent, slightly less than the 4.30 percent reduction projected by EIFS. While approximately 5,300 Soldier and Army government civilian positions would be lost within the ROI, RECONS estimates another 398 military contract and service jobs would be lost, and an additional 494 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in employment would be 6,208 jobs, or a 6.85 percent change in regional employment, which would be 0.68 percentage points less than projected by EIFS.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 1 would lead to a net reduction of economic activity within the ROI that is of a similar order of magnitude.

Population and Demographics. Fort Polk anticipates a substantial reduction in military population throughput as a result of the implementation of Alternative 1.

Housing. Alternative 1 would increase the availability of barracks space for unaccompanied personnel and increase the availability of Family housing on post. Those outcomes would likely decrease the off-post demand for rentals and purchases of housing. Fort Polk anticipates long-term, less than significant adverse economic effects in Leesville and Deridder, and in the smaller communities of the ROI.

Schools. Fort Polk anticipates the potential for significant adverse impacts to the Vernon and Beauregard Parish schools as a result of the implementation of Alternative 1. These school districts have invested in school facilities to support the population growth of Fort Polk that resulted from the 2005 Stationing of the 10th Mountain Division (4/10 BCT) and other Army stationing actions. Adverse impacts are likely for the both parishes resulting from a decrease in student numbers and federal funding which would directly impact local schools within the ROI.

Public Health and Safety. As a result of Alternative 1, the anticipated population decrease at Fort Polk would likely reduce the demand for law enforcement services, fire and emergency services, and medical care services on and off post. Fort Polk anticipates less than significant impacts to public health and safety under the Proposed Action.

Family Support Services. As a result of Alternative 1, Fort Polk anticipates a reduced demand for FMWR and ACS programs on post. The demand for Family support services off post would likely decrease also. Fort Polk anticipates less than significant impacts to Family support services under the Proposed Action.

Recreation Facilities. Use of recreation facilities on post would likely decline as a result of Alternative 1. Fort Polk anticipates that utilization decreases would be minor or moderate.

Environmental Justice. As a result of Alternative 1, Fort Polk anticipates no disproportionate adverse impact to minorities, economically disadvantaged populations, or children. Job losses would likely be felt across the ROI, affecting all income levels and many economic sectors. Beauregard and Vernon parishes have a lower percentage of African American people than the State of Louisiana as a whole. Vernon County, on the other hand, has a higher Hispanic population percentage. Seen from a statewide level, therefore, adverse impacts to Vernon Parish could be seen as having a disproportionate adverse impact on Hispanic people.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Economic Impacts. Alternative 2 would result in the increase of up to 1,000 Soldiers, each with an average annual income of $41,830. In addition, this alternative would affect an estimated 550 spouses and 960 dependent children for a total estimated potential impact to 1,510 dependents. The total population of military employees and their dependents directly affected by Alternative 2 is projected to be 2,510 military employees and their dependents.

Based on the EIFS analysis, there would be no significant impacts for sales volume, income, employment, or population. The range of values that would represent a significant economic impact in accordance with the EIFS model are presented in Table 4.16-9. Table 4.16-10 presents the projected economic impacts to the region for Alternative 2 as assessed by the Army's EIFS model.

Table 4.16-9. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 2

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	8.90	7.17	5.1	3.43
Economic Contraction Significance Value	- 9.28	- 7.71	- 5.15	- 2.42
Forecast Value	0.81	0.81	1.41	0.88

Table 4.16-10. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$53,387,210	$48,106,340	1,108 (Direct) 175 (Indirect) 1,283 (Total)	2,510
Percent	0.81	0.81	1.41	0.88

The total annual gain in direct and indirect sales in the ROI represents an estimated +0.81 percent change in total sales volume from the current sales volume of $6.58 billion within the ROI. It is estimated that state tax revenues would increase by approximately $2.14 million as a result of the gain in revenue from sales increases. Some parishes within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be gained at the parish and local level. Regional income would increase by 0.81 percent. While 1,000 Soldiers would be gained within the ROI, EIFS estimates another 108 military contract service jobs would be gained, and an additional 175 jobs would be created indirectly as a result of the increase in demand for goods and services in the ROI. The total estimated employment in the ROI would increase by 1,283 jobs, or a 1.41 percent change in regional non-farm employment. The total number of employed positions (military and non-farm private employment) in the ROI is estimated to be approximately 90,500. A population increase of 0.88 percent within the ROI is anticipated as a result of this alternative. Of the approximately 284,000 people (including those residing on Fort Polk) that live within the ROI, 2,510 military employees and their dependents would be begin to reside in the area following the implementation of Alternative 2. This would lead to an increase in demand for housing, and decreased housing availability in the region. This could lead to a slight increase in median

home values. It should be noted that this estimate of population increase includes civilian and military employees and their dependents.

Table 4.16-11 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 2.

Table 4.16-11. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment
Total	$34,000,109 (Local) $60,016,979 (State)	$53,292,523	1,157 (Direct) 212 (Indirect) 1,369 (Total)
Percent	0.52	0.90	1.51

The total annual gain in direct and indirect sales in the region represents an estimated 0.52 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 0.29 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would increase by approximately $2.4 million as a result of the gain in revenue from sales reductions, which would be $260,000 more additional state sales tax revenue that projected by the EIFS model. Regional income is projected by RECONS to increase by 0.90 percent, which is slightly more than that 0.81 percent increase projected by EIFS. While 1,000 Soldiers would be gained within the ROI, RECONS estimates another 157 military contract and service jobs would be gained, and an additional 212 jobs would be created indirectly as a result of increased demand for goods and services in the ROI. The total estimated change in non-farm employment would be a gain of 1,369 jobs, or a +1.51 percent change in regional non-farm employment, which would be 0.1 percentage points more than projected by EIFS.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 2 would lead to a net increase of economic activity within the ROI of a similar magnitude.

Population and Demographics. As a result of the implementation of Alternative 2, Fort Polk anticipates a minor increase in military population throughput.

Housing. Alternative 2 would likely add to the pool of Soldiers that want to live on post. Barracks space for unaccompanied personnel and quarters for Families would be available to a smaller percentage of Soldiers in the total Fort Polk population. As a result, the demand for off-post rentals and purchases of housing would likely increase. Fort Polk anticipates long-term, minor beneficial impacts in Leesville and Deridder, Louisiana, and in the smaller communities of the ROI.

Schools. Fort Polk anticipates the potential for minor impacts to the Vernon and Beauregard Parish schools as a result of Alternative 2. Both school districts have integrated higher numbers of students into their schools due to the stationing of the 4/10th Mountain BCT and other stationing actions in recent years.

Public Health and Safety. As a result of Alternative 2, the anticipated population increase at Fort Polk would likely increase the demand for law enforcement services, fire and emergency services, and medical care services on and off post. Fort Polk anticipates minor impacts to public health and safety under the Proposed Action.

Family Support Services. As a result of Alternative 2, Fort Polk anticipates an increased demand for FMWR and ACS programs on post. The demand for Family support services off post would also likely increase. Fort Polk anticipates minor impacts to Family support services under the Proposed Action.

Recreation Facilities. Use of recreation facilities on post would likely increase as a result of Alternative 2. Fort Polk anticipates that utilization increases would be minor. Some facilities could become crowded and less user-friendly during peak use hours.

Environmental Justice. As a result of Alternative 2, Fort Polk anticipates no disproportionate adverse impact to minorities, economically disadvantaged populations, or children. The impacts of the anticipated growth of Fort Polk would be felt throughout the ROI and across all populations.

4.16.8 Land Use Conflicts and Compatibility

4.16.8.1 Affected Environment

The installation has an access control fence which provides cantonment areas with a secure and continuous, well-delineated, and controlled boundary and separates the cantonment area from Fort Polk's training lands. Two developed areas, North and South Fort, total approximately 6,307 acres on the main post. South Fort Polk is the primary area, consisting of headquarters, support facilities, and an airfield. North Fort Polk consists of both temporary and permanent structures.

Land use at the JRTC and Fort Polk is divided into eight categories. In general, the installation land use plan functions appropriately, separating land uses that often conflict. Because of this, the installation benefits with continuous land use units bordering appropriate categories of differing land uses. Overall, land use at the JRTC and Fort Polk is not fragmented.

An artillery range impact area covers most of the eastern to central portion of Fort Polk main post. Zion Hills Small Arms Impact Area is located in the Southwestern part of the main post. Peason Ridge training area lies northwest of the main post. This area is divided into six sections. A third cantonment area lies on the east side of Peason Ridge, and the north-central region of Peason Ridge is an impact area.

Section 4.16.1 describes the land ownership occurring on Fort Polk. Those lands permitted to the Army by the USFS have allowable training activities permitted in the Special Use Agreement and Operating Plan. Numerous training activities, (e.g., mounted and dismounted maneuvers, vehicle convey and airborne operations and others), occurs within the IUA, LUA, and SLUA on Fort Polk Table 4.16-12 contains the land use types, total acreages of land areas, and the corresponding land use requirements on Fort Polk.

Table 4.16-12. Land Use at Fort Polk

Land Ownership	Total Training Land Acreage	Total Range and Impact Area	Total Maneuver Area	Total Unusable Acreage	Available Maneuver Acreage with Surface Danger Zones	Available Maneuver Acreage without Surface Danger Zones
Army owned	91,049[1]	62,269	28,780	6,938	21,842	78,646
Forest Service owned	98,125[2]	33,572	64,553	49,835	14,718	24,664[3]
Total	189,174	95,841	93,333	56,773	36,560	103,310

Source: Fort Polk, 2005

[1]Does not include 8,050 acres in the cantonment area, 442 acres of leased lands, 387 acres in easements, 24.31 acres at Toledo Bend Recreation site, or 56.79 acres in railroad right-of-ways; total Army fee-owned land is 100,009.1 acres.

[2]Includes 40,026 acres of Intensive Use, 44,799 acres of Limited Use, and 12,820 acres of Special Limited Use Land.

[3]42,901 acres of Limited and Special Limited Use Lands are considered unusable for training.

4.16.8.2 Environmental Consequences

No Action Alternative

No changes to land use conditions would occur and no effects are anticipated under the No Action Alternative.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

There would be negligible short and long-term impacts on installation land use due to the loss of Soldiers. The installation would continue to have sufficient vacant space in buildings that would be suitable for other units' mission and administrative requirements. The land use at the installation would not be affected by the loss of these Soldiers since the land use categories and compatibility would continue to exist and be utilized.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor impacts, from land use conflicts and compatibility anticipated. Up to 1,000 additional Soldiers would require the additional use of training areas and qualification ranges. These uses would not exceed an increase in use of more than 10 percent of the current usage levels. Increased use of live-fire ranges by new units could preclude the use of maneuver areas for training by other units that would not be accessible for safety reasons. This would require the need for increased balancing of the scheduling of maneuver and live-fire training activities. There would be negligible short and long-term impacts on installation land use due to the increase of up to 1,000 Soldiers and their Family members assigned to the installation. The installation has sufficient vacant space in buildings that would be suitable for supporting the units' mission. Additionally, the land and existing facilities are located in such a way that additional facilities could be built to support additional Soldiers if funding for new facilities were to become available.

4.16.9 Hazardous Materials and Hazardous Waste

4.16.9.1 Affected Environment

The affected environment for the Proposed Action includes the use, storage, transport, and disposal of hazardous materials and waste at Fort Polk. This includes hazardous materials and waste from USTs and ASTs, pesticides, LBP, asbestos, PCBs, radon, and UXO.

Common hazardous materials present at the installation include POLs; paint and paint-related material from paint shops and motorpools; flammable stains and coatings; cleaning products; photographic wastes; batteries; pesticides, insecticides, rodenticides, and herbicides; bomb propellants; smoke pots; flammable adhesives; solvents; calcium hypochlorite; and nonexpended ammunition. Hazardous waste streams generated at the installation include the above-mentioned items in addition to lead-contaminated paint chips and debris and gasoline-contaminated rags, soil, or used Drysweep. Nonregulated wastes include oil-, fuel-, and grease-contaminated rags and debris; all petroleum-contaminated soil and used Drysweep; grease; used oil; oil and fuel filters; used antifreeze; brake and transmission fluid; asbestos; and nonflammable adhesives (JRTC, 2004).

The installation is a large-quantity generator of hazardous wastes. Hazardous materials and waste are primarily managed by the Environmental and Natural Resources Management Division. The Environmental and Natural Resources Management Division publishes a HWMP and an Oil and Hazardous Substances Contingency Plan. These documents provide SOPs for the collection, storage, transport, and disposal of hazardous materials and waste (JRTC, 2004).

4.16.9.2 Environmental Consequences

No Action Alternative

Overall, negligible effects are anticipated under the No Action Alternative. There would be no change in Fort Polk's management of hazardous materials, toxic substances, hazardous waste, or contaminated sites. Fort Polk would continue to manage existing sources of hazardous waste in accordance with the HWMP.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Minor impacts are anticipated as a result of the implementation of Alternative 1. In the short term, there would be an increase in the demolition of outdated and no longer needed facilities. This would increase the volume of solid waste generated, though the waste generated would not exceed the capacity of the installations waste handling systems. An increase in asbestos and LBP disposal would be anticipated until facility reduction was completed as a result of this alternative. Construction workers and Army personnel would take measures to dispose of materials in accordance with regulatory requirements and installation HWMP.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Minor impacts from hazardous materials and waste would occur with an increased Soldier strength of 1,000. The storage, use, handling, and disposal of hazardous materials, toxic substances, and hazardous wastes would not increase the risk to human health or environmental contamination. The implementation of Alternative 2 would not be expected to result in any increased violations of applicable federal, state, local, or DoD regulations. Existing management procedures, regulations, plans, and permits would be used to minimize risk.

4.16.10 Traffic and Transportation

4.16.10.1 Affected Environment

Fort Polk is located in west central Louisiana, approximately 125 miles west, northwest of Baton Rouge, Louisiana and 90 miles north of the Gulf of Mexico. The ROI evaluated for traffic and transportation includes Fort Polk and the parishes of Beauregard, Natchitoches, Rapides, Sabine and Vernon in Louisiana.

Access to the cantonment area is by U.S. Route 171, LA Highway 10, and State Highway LA-28. U.S. Route 171 is a principal rural arterial linking Shreveport, 110 miles to the north, with Lake Charles 70 miles to the south. State Highway LA-28 is an east-west running primary rural arterial linking Leesville to Alexandria and points east. The City of Leesville and Town of New Llano are the population centers nearest to Fort Polk. Leesville and New Llano are adjacent to each other, generally located about 10 miles northwest of the cantonment area. Leesville, DeRidder, and New Llano provide the only shopping, dining, and entertainment within a 25-mile radius of Fort Polk.

4.16.10.2 Environmental Consequences

No Action Alternative

Negligible impacts are anticipated under the No Action Alternative. Surveys and studies conducted on the existing transportation system determined that it is sufficient to support the current traffic load.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

Beneficial traffic impacts resulting from a reduction in force at Fort Polk would be anticipated as a result of the implementation of Alternative 1. It is anticipated that traffic congestion would diminish in and around key ACPs and entrance gates. The roads would continue to be maintained at acceptable LOS for on- and off-post commuters, and LOS would improve slightly as traffic volume decreased. The Fort Polk traffic system is currently providing acceptable LOS for Fort Polk's Soldiers, their Family members and civilian employees.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor, short and long-term impacts on traffic on the installation due to the presence of an additional 1,000 Soldiers and their dependents. The increase in off-post traffic would have a minimal impact on traffic in the community overall. The implementation of the alternative would not contribute to a decrease in the LOS of the road network leading to the installation, particularly during peak morning and afternoon travel periods. This increase in population would also have a minor impact on the traffic volume on the installation on some of the installation's main and arterial routes. The Fort Polk transportation system has the capacity to accommodate additional Soldier and dependent growth with minimal impacts to traffic, however.

4.16.11 Cumulative Effects

Region of Influence

The ROI for this cumulative impact analysis of Army 2020 realignment at Fort Polk encompasses Beauregard, Natchitoches, Rapides, Sabine and Vernon Parishes in Louisiana.

Alexandria, Deridder, Leesville, Natchitoches are the largest cities within the ROI. Fort Polk has long been a key component of the state's economy employing several thousand Soldiers and

civilian employees within the ROI. Fort Polk has been in operation and supporting the Army since early 1940s.

There are numerous planned or proposed actions within the ROI that have the potential to cumulatively add impacts to Army Force 2020 alternatives. These actions are either in progress or reasonably could be initiated within the next 5 years. A number of the Army's proposed projects have been previously identified in the installation's Real Property Master Planning Board and are programmed for future execution. A list of projects below presents some of the projects which may add to the cumulative impacts of the implementation of Army 2020 realignment alternatives.

Fort Polk Projects (Past, Present, and Reasonably Foreseeable)

Past Projects

- Construction of the Digital MPRC;
- Permanent Stationing of the 4/10;
- Construction of the Combined Arms Training Facility;
- Construction of the Corrosion Prevention Facility;
- Construction of the FY 2010 Multi-Purpose Machine Gun Range;
- Construction and Operation of a Drop Zone Expansion; and
- Construction and Operation of a Consolidated Fuel Facility.

Present Projects

- Construction of the FY 2012 Multi-Purpose Machine Gun Range;
- Land Acquisition Purchase; and
- Commercial Forestry Operations.

Future Projects

- Future Land Acquisition purchases and training land preparation project; and
- Ongoing commercial forestry operations.

Other Agency (DoD and non-DoD) and Other Public/Private Actions (Past, Present, and Reasonably Foreseeable)

- Four segments of LA-28 totaling 23 miles have been modified to four-lanes;
- Widening of several segments of State Highway LA-28 (the major arterial between Alexandria and Leesville);
- Currently undergoing a 9.9 mile section from the west junction of State Highway LA-121 to the junction of State Highway LA-465, and another 4.3 mile section from there to the Rapides/Vernon Parish Line;
- State of Louisiana Regional Growth Management Strategy investment of $25 million for utility and arterial construction;
- Privatization of Natural Gas;
- West-Central Ecosystem Partnership for conservation of longleaf pine ecosystems; and
- ACUB.

Fort Polk anticipates a range of cumulative effects resulting from the implementation of the Proposed Action and alternatives. Cumulative impacts for each alternative are as follows:

No Action Alternative

Negligible cumulative impact would be anticipated from implementing the No Action Alternative. Under the No Action Alternative, no changes in military authorizations, or local environmental conditions would be anticipated. Installation facility shortages and excesses would remain at their currently planned levels without additional stationing or force reductions. Traffic conditions would improve slightly with the future completion of state highway projects and other traffic improvements. The Army would continue to implement some facilities reductions of outdated/unused facilities.

Alternative 1: Force Reduction (up to 5,300 Soldiers and Army Civilians)

As a result of Alternative 1, the Army anticipates beneficial to minor adverse cumulative impacts to air quality, water resources, Energy demand/generation, hazardous materials and waste. The reduction of Soldiers at Fort Polk would result in less training and a reduced frequency of garrison support activities. When viewed in conjunction with other past, present, and reasonably foreseeable projects, the overall cumulative effect of Alternative 1 are projected to be minor, with cumulative beneficial impacts to some resources.

The cumulative socio-economic impact within the ROI under Alternative 1 would be a significant adverse impact. Regionally, off-post unemployment has risen within the ROI from 2008 to 2012. Reductions in federal employment by the Army would be partially off-set by employment of the Louisiana Department of Transportation as part of efforts to make state highway improvements. However, the Army and Fort Polk are among the top employers in the state of Louisiana and are the top employers in the ROI. Cumulatively, socioeconomic impacts would be significant within the ROI.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Cumulatively, in conjunction with Alternative 2 the Army anticipates no more than minor impacts to the following VEC resources: airspace, cultural resources, noise, soil erosion, water resources, facilities, socioeconomics, energy demand and generation, land use, hazardous materials and hazardous wastes, and traffic and transportation. A less than significant adverse cumulative impact is anticipated to air quality as state highway improvements, construction, and preparation of Fort Polk's training lands currently being acquired would add to NAAQS pollutant emissions in the future and emit more O_3, PM, and fugitive dust, throughout the airshed. Cumulatively, less than significant impacts would be expected and the region would be projected to remain in attainment for these CAPs. State highway projects in conjunction with the implementation of Alternative 2 and training land improvements would have minor cumulative impacts on biological resources and wetlands. These actions would not result in unpermitted destruction of wetlands without appropriate mitigation. Fort Polk would continue to implement natural resource management plans to mitigate impacts to biological resources when improving newly acquired training areas.

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4.17 FORT RILEY, KANSAS

4.17.1 Introduction

Fort Riley is a permanent Army garrison that currently supports the 1st Infantry Division. The garrison's basic function is to ensure that the 1st Infantry Division and other units have the training resources and facilities needed to meet their mission requirements.

The focus of the 1st Infantry Division is to deploy, conduct full spectrum operations as part of a Combined Joint Task Force or other designated force headquarters, transition to follow-on operations, and to redeploy as necessary.

The Division Headquarters and Headquarters Battalion located at Fort Riley supports the 1st Infantry Division. Fort Riley is home to three BCTs: 1st Brigade, 1st Infantry Division; 2nd Brigade, 1st Infantry Division; and 4th Brigade, 1st Infantry Division; as well as the 1st SUSBDE, 1st Infantry Division; the CAB, 1st Infantry Division; and other units. These organizations conduct most of their training at Fort Riley.

Located in Central Kansas, Fort Riley has approximately 70,000 acres of maneuver area suited for vehicular and non-vehicular military training (Figure 4.17-1). The installation is surrounded by Clay, Dickinson, Riley, and Geary counties. Fort Riley has long supported live-fire and mechanized unit training.

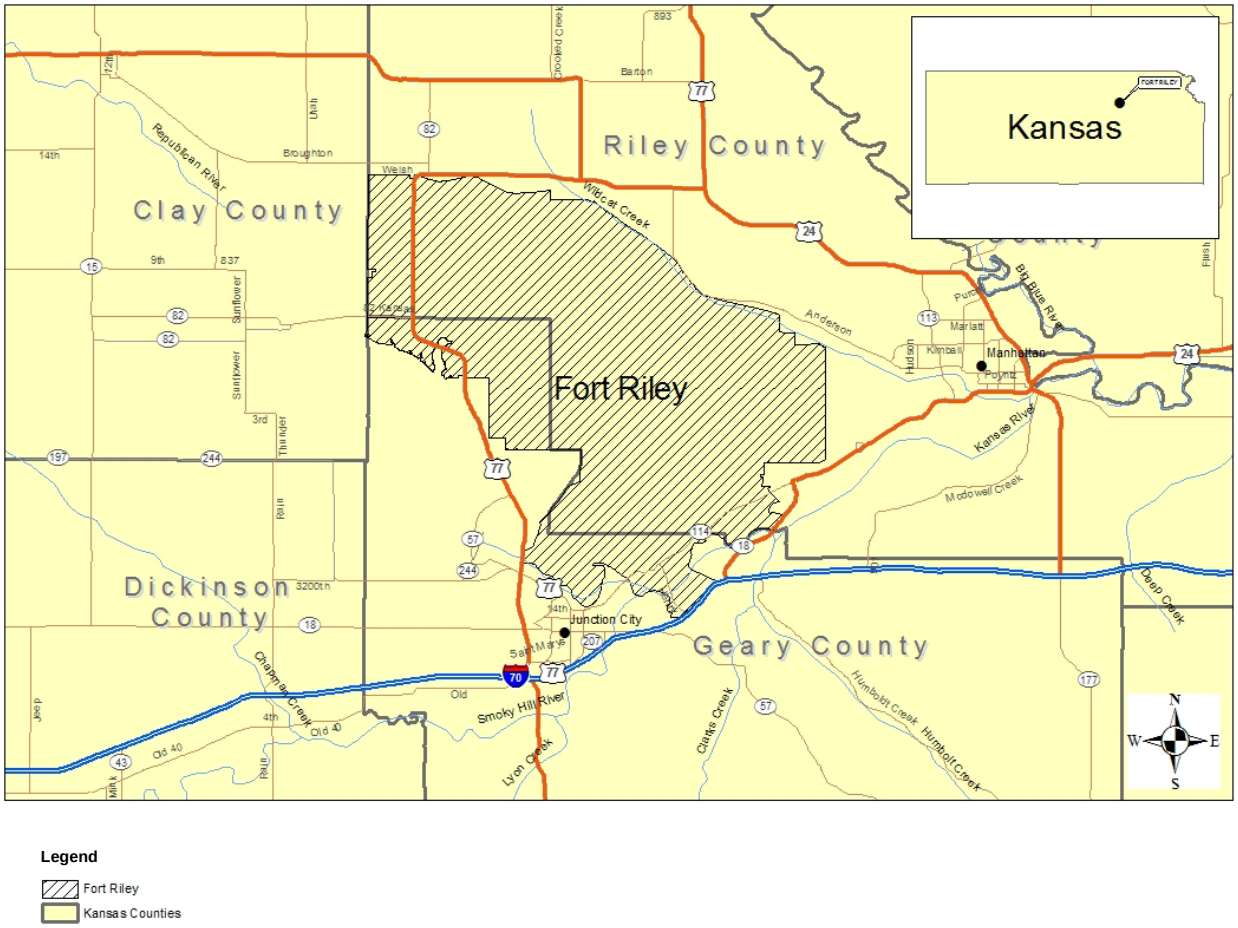

Figure 4.17-1. Fort Riley

4.17.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, Fort Riley does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 8,000 Soldiers and Army Civilians) or Alternative 2 (Installation gain of up to 3,000 Soldiers). However, significant socioeconomic impacts to economic activities, housing, and school districts are anticipated as a result of Alternative 1. Table 4.17-1 summarizes the anticipated impacts to VECs from each alternative.

Table 4.17-1. Fort Riley Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 8,000	Alternative 2: Growth of up to 3,000
Air Quality	Minor	Beneficial	Minor
Airspace	Negligible	Negligible	Minor
Cultural Resources	Negligible	Minor	Minor
Noise	Negligible	Beneficial	Minor
Soil Erosion	Minor	Minor	Minor
Biological Resources	Negligible	Beneficial	Minor
Wetlands	Negligible	Negligible	Negligible
Water Resources	Minor	Beneficial	Minor
Facilities	Negligible	Minor	Minor
Socioeconomics	Beneficial	Significant	Significant
Energy Demand and Generation	Negligible	Beneficial	Minor
Land Use Conflict and Compatibility	Negligible	Negligible	Negligible
Hazardous Materials and Hazardous Waste	Negligible	Minor	Negligible
Traffic and Transportation	Negligible	Beneficial	Minor

4.17.1.2 Valued Environmental Components Dismissed from Detailed Analysis

For the VECs discussed in this section below, no more than a beneficial or negligible impact would be anticipated. Therefore, these VECs are not being carried forward for detailed analysis, as no potential for significant impacts exists.

- ***Wetlands.*** Wetland areas on Fort Riley include springs, seeps, streams, rivers, ponds, lakes, vernal pools and emergent marshes. Approximately 1,536 acres of wetlands are present on the installation according to a NWI completed in 1991 by the USFWS. Of this total, 972 acres are considered permanent wetlands. The majority of all wetlands are riverine; riverine habitat comprises 144.8 miles and encompasses 748 acres. Lacustrine and palustrine wetlands cover 431 and 270 acres of the installation, respectively (Fort Riley, 2010).

  There would be a negligible impact on installation wetlands. Training activities would be limited to established training areas. Efforts would be made to avoid any impacts on

wetlands by using the installations wetland planning level surveys and geographic information system (GIS) mapping. The potential exists for military training to impact wetlands, but those impacts would not be anticipated to be more than temporary, resulting primarily from sedimentation impacting wetland function. Fort Riley range and environmental personnel would continue to coordinate with one another to avoid and minimize wetland impacts. Most wetlands areas are designated off-limits. If it appears that wetland impacts are unavoidable, the appropriate level of permitting and mitigation would be obtained prior to any construction or demolition.

- ***Land Use Conflicts and Compatibility.*** Land use on the installation has been categorized into twelve general types: training ranges, open space, Family housing, outdoor recreation, maintenance, airfield, supply storage, community facility, industrial, unaccompanied personnel housing, administration, and medical. Training ranges are the predominant land use at Fort Riley, with almost 90,000 acres, or approximately 90 percent of the installation reserved for training and range activities. Training areas encompass much of the cantonment area, and extend throughout the entire north portion of the installation. Training areas within the cantonment area are used for instruction and academics as well as indoor firing ranges, and necessary ancillary facilities associated with training. Training areas outside the cantonment area are typically firing ranges and impact areas. Open space is unoccupied land that provides transition areas between land uses, as well as a buffer between the installation and areas off post. These areas are found throughout the installation. Family housing areas are areas with residential units occupied by enlisted and officer Families. Outdoor recreation areas provide outdoor athletic and recreation facilities for a variety of interests, including natural resources and cultural values. Maintenance areas include facilities and shops that are for the maintenance and repair of Army equipment, and are located throughout the cantonment area. Airfield includes the areas necessary for the operation and maintenance of Marshall Army Airfield, and is located only in the southeastern portion of the installation. Supply and storage areas are designed for bulk-type storage of all classes of Army supplies, and are located throughout the cantonment area. Community facilities include commercial services such as the Post Exchanges, eating establishments, and theaters, and community facilities such as schools and churches. Community facilities are located in the cantonment area, and are typically near to housing areas. Industrial areas include facilities for manufacturing Army equipment and materials, utility plants and waste disposal facilities. These areas are located within the cantonment area, and are not compatible with housing areas. Unaccompanied Personnel Housing is located in several areas within the cantonment area and provides enlisted and officer barracks as well as associated administrative and community facilities for these personnel. Administration areas are typically headquarters or office buildings to accommodate offices and technical activities. These areas are located in cantonment area, and some areas are included within the RCI footprint. Medical areas include areas for inpatient and outpatient medical services, including the Irwin Army Community Hospital located northeast of the main post housing area.

  The cantonment area includes land uses such housing, community services, recreation, administrative support, industrial, and transition areas. Community services include commercial services such as the Post Exchanges, eating establishments, and theaters, and community facilities such as schools and churches. Community services are scattered around the cantonment area. Recreation and buffer areas generally separate the Family housing areas and community services from the remainder of the cantonment area. The recreation and buffer areas include ball fields and other recreational facilities and open space (Fort Riley, 2005).

Impacts to land-use would be negligible under all of the alternatives. Fort Riley would continue to support it primary military training mission as a result of all alternatives. The installation has sufficient vacant space in existing buildings, sufficient land available to build facilities, or a combination thereof, to meet the mission requirements of additional units. Fort Riley anticipates that lands and facilities use by gaining units would be compatible with neighboring land use.

Fort Riley anticipates that the implementation of any of the alternatives would result in negligible impacts for those VECs discussed above. The following provides a discussion of the VECs requiring a more detailed analysis, as they are anticipated to have the potential of a higher level of impact as a result of the implementation of the Proposed Action alternatives.

4.17.2 Air Quality

4.17.2.1 Affected Environment

Fort Riley is located in portions of Geary, Riley, and Clay counties, in northeastern Kansas, which is controlled by the North Central Kansas Intrastate AQCR. All three counties are in attainment for the six criteria pollutants and meet NAAQS.

Fort Riley is a major source of air pollutants and regulates air emissions through a Class I Air Emission Source Operating (Title V). Primary stationary sources include boilers, generators, fuel storage and dispensing areas, and surface coating operations (Fort Riley, 2005).

Since Fort Riley is located in an attainment area there is no requirement to conduct a conformity analysis. The CAA's PSD requirements are not anticipated to be triggered by the installation's activities.

4.17.2.2 Environmental Consequences

No Action Alternative

No change to the type or the frequency of training events would occur as a result of the implementation of the No Action Alternative. Although there would continue to be minor short- and long-term fugitive dust impacts from training, these impacts would not exceed threshold levels. Permit conditions would continue to be monitored and met, but no changes to or increases in emission sources are anticipated, other than those mandated by maintenance, replacement, or elimination of sources as they age and/or are removed from service.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to air quality resulting from the reduction in unit training events and the accompanying reduction in stationary and mobile emission sources, to include POV emissions. Conditions identified in air permits would continue to be monitored and may require changes as a result of the implementation of Alternative 1. Specifically, the permit may require modification to reflect the lowered emission levels resulting from less combustion and generation of NAAQS pollutants and HAPs associated with the reduction in the number of Soldiers engaged in military training and less vehicle traffic. Emissions from training, facilities operations, and vehicles would all be projected to decrease. In addition, there would be less fugitive dust generated from fewer unit training events.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor (low) impact on air quality. An increase in emissions from mobile and stationary sources would result from the stationing of additional Soldiers and their Families at Fort Riley. The increased emissions and fugitive dust would be

derived from military vehicles, POVs, and generators supporting training events, but would not cause Fort Riley to exceed the limits of its Title V permit or cause any change in its attainment status. Any construction related emissions have the potential to produce localized, short-term elevated air pollutant concentrations but these are not anticipated to have a major effect on regional air quality. Over the long term, combustion emissions and fugitive dust resulting from training would be primarily from mobile sources. Air modeling indicates the installation could support the action with minimal impacts to air quality.

4.17.3 Airspace

4.17.3.1 Affected Environment

Fort Riley has 158 square miles of FAA-designated Restricted, SUA, up to 29,000 feet. The installation has access to this airspace continuously, and is controlled by the FAA of Kansas City, Missouri (USACE, 2002). Military uses of airspace at Fort Riley include air corridors over and in the vicinity of the installation for training of rotary-wing and fixed-wing aircraft.

4.17.3.2 Environmental Consequences

No Action Alternative

The No Action Alternative would not produce any conflicts with overlying restricted airspace, as no proposed change to existing conditions would occur. Thus, impacts would be negligible.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have negligible impacts to airspace, as the installation's military airspace use would not change significantly with the loss of ground units. Aviation and UAS units would continue to require airspace to support training, but at a slightly lower utilization level, as there would be a decreased number of UAS and integrated air-ground training events to support.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor adverse impact to airspace. The number and type of aircraft utilizing the SUA would not change substantially and additional airspace would not be required to support the additional ground units; however, implementation of Alternative 2 would result in an increase in scheduling, activation, and utilization of the existing SUA. The increased operations could cause some minor impacts to air traffic flow within the National Airspace System around Fort Riley. Adhering to the existing airspace management and scheduling operations should minimize potential conflicts and impacts, despite additional time and use demands for the SUA.

4.17.4 Cultural Resources

4.17.4.1 Affected Environment

The affected environment for cultural resources is the footprint of Fort Riley. Fort Riley possesses both historic and archaeological resources.

Humans have traversed the boundaries of Fort Riley for over 10,000 years. The earliest travelers through the area were Native American hunter and gatherers who traveled great distances following game including mammoth and now extinct sub-species of Bison. Later Native Americans, who adopted practices such as small scale agriculture, were able to make Fort Riley a more permanent home. Fort Riley was established as a frontier cavalry post in 1853. The construction of the first permanent structures began in 1854. Visitors to Fort Riley will notice that the buildings were constructed of native limestone which was the most readily available construction material in Kansas at that time. The original military installation

established at the confluence of the Smoky Hill and Republican rivers was only 23,000 acres. Many early settlers also made the trek to Fort Riley to take advantage of fertile farm grounds, and the ready market for their goods that the early post provided. Fort Riley expanded in 1941, and again in 1965 to its present size. When the post expanded it overtook many of these early European American settlements. All of these prehistoric and historic activities have left a mark on Fort Riley.

The staff of Fort Riley CRMP (Conservation Branch, Environmental Division, DPW) is charged with identifying, evaluating, and protecting all of Fort Riley's cultural resources including historic buildings, archeological sites, artifacts, and Native American sacred sites. Protecting Fort Riley's cultural resources means coordinating with installation tenants, partners, and the public, including federally recognized Tribes with ancestral ties to the land where Fort Riley is located. The program sponsors an active archeological and historic building survey and evaluation program that includes managing the main post Historic District. The staff of the CRMP also maintains a state of the art curation facility to safely store all of the artifacts recovered during archeological and historic building surveys and evaluations.

The CRM program has identified, and manages, 911 archeological sites including 560 historic civilian, 118 historic military, 14 multi-component and 219 prehistoric archeological sites. Each of these 911 known sites must be evaluated to determine whether or not it is significant enough to warrant inclusion of the NRHP. Those determined to be NRHP significant are actively preserved. To date, 37 sites have been determined eligible for the NRHP; however, many still remain to be discovered, and staff of the CRM Program has only surveyed approximately 60 percent of Fort Riley's 101,000 acres. The CRM Program staff also manages the main post Historic District. The main post Historic District is a 1-mile square area containing 294 historic buildings, landscapes and monuments. It has been listed on the NRHP since 1974. Many of these buildings have been retrofitted for numerous adaptive reuses to serve the modern military.

A Programmatic Agreement between the DA, Fort Riley, the Kansas SHPO, and the ACHP addresses activities at the garrison that affect historic properties included in or potentially eligible for inclusion in the NRHP (Fort Riley, 2006a). The Programmatic Agreement ties together the more specific management practices and activities that the garrison had been accomplishing under several individual management plans and agreements.

4.17.4.2 Environmental Consequences

No Action Alternative

Impacts to cultural resources from the No Action Alternative would be negligible. Activities with the potential to affect cultural resources are monitored and regulated when anticipated through a variety of preventative and minimization measures.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated minor adverse impact to cultural resources. Removal of temporary facilities vacated by departing units would have a very low potential for adverse impacts to archeological resources due to the minimal amount of ground disturbance associated with such actions. Removal of outdated and under-utilized infrastructure has the potential to affect historic structures, but would be conducted in accordance with the current procedures outlined in the installation's 2006 Programmatic Agreement with the SHPO (Fort Riley, 2006a). If an undertaking has the potential to adversely affect historic properties, consultation with the SHPO would occur, per 36 CFR 800, as required. There is a low potential for potentially eligible historic structures to be affected as a result of this action. Facilities requirements would be reduced along with training land use intensity, reducing the risk of NHPA, ARPA, or NAGPRA violations.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor impact to cultural resources. Measures are in place to accommodate training while minimizing potential adverse impacts to cultural resources. The types of training conducted by the additional Soldiers would not change, although some training areas on Fort Riley might experience more frequent or intense use compared with current baseline conditions. The ICRMP addresses consultation requirements for anticipated training impacts, and Fort Riley would continue to follow these procedures. Increased use of established ranges has the potential to increase the use of adjacent bivouac areas, potentially leading to the loss of some cultural resources through associated small-scale ground disturbance.

4.17.5 Noise

4.17.5.1 Affected Environment

The noise environment at Fort Riley is impacted by operations common to many active Army installations. These operations include small arms and heavy weapons firing, demolition activities, and aircraft operations. Other sources of noise from installation operations and activities include maintenance and shop operations, ground traffic, construction, and similar sources; however, this noise is generally confined to the installation and is comparable to sounds that occur in communities adjacent to the installation.

U.S. Army Center for Health Promotion and Preventive Medicine, now named the Public Health Command, conducted a study (Fort Riley, 2006b), to provide Fort Riley with aviation, as well as, small and large caliber weapons noise contours to evaluate impacts of proposed BRAC stationing actions. That study used two noise simulations programs to assess noise resulting from large caliber (20mm and larger) and small caliber (.50 caliber and smaller) weapons firing. A third program was used to determine adequate noise buffer zones to reduce potential annoyance from aircraft operations. In 2009, small caliber noise was reanalyzed and small arms noise contours were updated in response to new small arms range construction.

4.17.5.2 Environmental Consequences

When evaluating the actions proposed in this PEA, the primary concern is the potential to change the frequency and duration of noise that is experienced in the local communities. The proposed alternatives would not introduce new weapons systems or aircraft, rather the frequency of training would increase or decrease depending upon whether the population of Soldiers increased or decreased. The anticipated environmental noise impacts for each of the proposed alternatives at Fort Riley follow.

No Action Alternative

Negligible impacts from noise are anticipated under the No Action Alternative. The acoustic environment of Fort Riley would continue to be affected by small- and large-caliber weaponry, artillery, and aircraft over-flight. Other activities, such as ground maneuver training and exercises resulting in noise created by personnel and vehicles, would continue to contribute noise on Fort Riley, to the same levels and intensity as historically experienced.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated negligible and slightly beneficial impact to the noise environment, with a reduction in the frequency of noise generating events. Existing ranges would still be utilized for firing the same types of weapons systems and conducting the same types of training. Fort Riley's remaining BCTs would also continue to conduct maneuver and

live-fire training in the field. However, a reduction of up to 8,000 Soldiers would reduce the installations noise contours and the size of existing NZs based on a decrease in the frequency of training events. While the frequency of training would be anticipated to change, the types of noise and weapons systems and vehicles used at Fort Riley would not be anticipated to change. Aviation units on Fort Riley would not be impacted by these decisions though frequency of aviation operations would be anticipated to decrease slightly leading to less aviation noise and a slight beneficial impact. With the loss of a BCT and other units less aviation support would be required.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor impact on the noise environment on the installation and surrounding communities due to the stationing of up to 3,000 Combat/Combat Support Soldiers. Noise modeling conducted in 2006 indicated that a dramatic increase in live-fire training activity would need to occur to impact sensitive receptor populations; however, increased large caliber weapons firing could result in larger noise contours further off post resulting in a higher frequency of complaints. Citizens in the surrounding communities would be impacted by a larger number of noise events from military training activities. The frequency of aircraft operations could increase slightly. Given that the additional of 3,000 Soldiers represents an increase of approximately 15 percent of the installations Soldiers, it is assumed this alternative would lead to an approximate 15 percent increase in the frequency of training activity and noise generating events at Fort Riley. Given that there are no new types of activities that would occur, just an increase in the frequency of existing noise generating activities, only minor impacts are anticipated to occur as a result of implementing this alternative.

4.17.6 Soil Erosion

4.17.6.1 Affected Environment

Fort Riley is located in the Central Lowlands province with elevations at approximately 1,000 feet. There are three types of topographical areas: high upland tall grass prairies, alluvial bottomland floodplains, and broken and hilly transition zones.

Fort Riley is part of the Great Plains Winter Wheat and rangeland Soil Resource Region. Most soils are friable, silt loam up to 12 inches thick, overlying nearly impervious clays.

4.17.6.2 Environmental Consequences

No Action Alternative and Alternatives 1 and 2

Implementation of all alternatives would result in minor impacts to soils. Fort Riley's prairie vegetation recovers quickly from surface disturbance caused by maneuver training. Fort Riley anticipates that reduced military training demands on maneuver lands would lessen short-term surface disturbance; however, even with increased training and increased surface disturbance, impacts are expected to be minor. The installation's ITAM program would continue to restore and rehabilitate military training lands to minimize soil erosion.

4.17.7 Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species)

4.17.7.1 Affected Environment

Most of Fort Riley is tall- and mixed-grass prairie dominated by big bluestem, indiangrass, and switchgrass; or "go-back" grassland that populates former croplands. The remainder of Fort Riley's natural area is primarily woodland.

Numerous systematic surveys conducted since 1990 have documented the presence of six federally and/or state-listed threatened and endangered species, and eighteen rare species. No recorded observations exist for 12 other listed or rare species, but there is a possibility that one or more of those species could occur on Fort Riley. Fort Riley's threatened and endangered species management most often involves controls on habitat for the Topeka shiner and other species to include the bald eagle, though it is no longer listed under the ESA. Details pertaining to the management of threatened and endangered species present on Fort Riley are contained in the garrison's 2010 INRMP (Fort Riley, 2010). Table 4.17-2 provides a list of species.

Table 4.17-2. Federally- and State-listed Species and Other Rare Species That Occur or Could Occur on Fort Riley

Common Name	Scientific Name	Federal	State	Possibility on Fort Riley
Common shiner	*Luxilus cornutus*		SINC	Resident
Southern redbelly dace	*Phoxinus erythrogaster*		SINC	Resident
Johnny darter	*Etheostoma nigrum*		SINC	Resident
Bobolink	*Dolichonyx oryzivorus*		SINC	Migrant
Black rail	*Laterallus jamaicensis*		SINC	Migrant
Black tern	*Chlidonias niger*		SINC	Migrant
Eskimo curlew	*Numenius borealis*	E	E	Possible
Ferruginous hawk	*Buteo regalis*		SINC	Migrant - possible winter resident
Golden eagle	*Aquila chrysaetos*		SINC	Transient
Henslow's sparrow	*Ammodramus henslowii*	SAR	SINC	Summer resident
Least tern	*Sterna antillarum*	E	E	Migrant – possible nesting
Piping plover	*Charadrius melodus*	T	T	Migrant – possible nesting
Rusty Blackbird	*Euphagus carolinus*	SAR		Migrant
Short-eared owl	*Asio flammeus*		SINC	Resident
Snowy plover	*Charadrius alexandrinus*		T	Migrant
Whip-poor-will	*Caprimulgus vociferous*		SINC	Summer resident
Long-billed Curlew	*Numenius americanus*		SINC	Possible
Whooping crane	*Grus Americana*	E	E	Possible
Yellow–throated Warbler	*Dendroica dominica*		SINC	Possible
Southern bog lemming	*Synaptomys cooperi*		SINC	Resident
Eastern spotted skunk	*Spilogale putorius*		T	Possible
Franklin's Ground Squirrel	*Spermopilus franklinii*		SINC	Possible
Eastern hognose snake	*Heterodon platirhinos*		SINC	Possible
Timber rattlesnake	*Crotalus horridus*		SINC	Possible
Western hognose snake	*Heterodon nasicus*		SINC	Resident
Texas horned lizard	*Phrynosoma cornutum*	SAR		Resident
Blue sucker	*Cycleptus elogatus*		SINC	Resident
Highfin Carpsucker	*Carpiodes velifer*		SINC	Possible
Plains minnow	*Hybognathus placitus*		T	Confirmed

Silver chub	*Macrhybopsis storeriana*		E	Possible
Sturgeon chub	*Macrhybopsis gelida*		T	Resident
Topeka shiner	*Notropis Topeka*	E	T	Resident
American burying beetle	*Nicrophorus americanus*	E	E	Possible
Prairie mole cricket	*Gryllotalpa major*		SINC	Resident
Regal fritillary butterfly	*Speyeria idalia*	SAR	NA	Resident
Western prairie fringed orchid	*Platanthera praeclara*	T	NA	Possible

E = Endangered, In danger of extinction throughout all or a significant portion of its range; Possible = Habitat is present and species range overlaps the area but the species is not documented on Fort Riley; SAR = Species at Risk, U.S. Army designation for priority species in need of conservation on installations; SINC = Species in Need of Conservation, Questionable ability to be self-sustaining species in Kansas; T = Threatened, Likely to become endangered within the foreseeable future.

4.17.7.2 Environmental Consequences

No Action Alternative

Negligible adverse impacts would occur at Fort Riley under the No Action Alternative. Fort Riley would continue to adhere to its existing resource management plans and to further minimize and monitor any potential impacts. Units are briefed prior to each training event regarding sensitive areas on post, such as protected species habitat.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to biological resources. Scheduling conflicts for training area access to conduct resource monitoring would be reduced. Proactive conservation management practices would be more easily accomplished with reduced mission throughput and there would be less training disturbance, allowing areas with habitat more time to recover with less potential for training related disturbance.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor adverse impact to biological resources. The increase in the number of Soldiers is less than 15 percent above the current level. While this moderate force augmentation would increase traffic in the training lands and ranges, it would not cause substantial degradation or destruction of threatened, endangered, or sensitive species habitats. Listed species and other special status species recorded on the installation would continue to be managed in accordance with the installation's INRMP and ESMP, terms and conditions identified within Biological Opinion(s) issued by the USFWS and any conservation measures identified in ESA, Section 7 consultation documents. Fort Riley proactively manages its conservation programs within the installation's training areas; however, access to training lands and ranges for the purpose of threatened and endangered species monitoring and habitat management would become more difficult with increased training. Access is essential to conduct management actions (prescribed burning, etc.) and to conduct monitoring in order to demonstrate that populations of threatened and endangered species are stable or increasing. Natural resource management staff would continue to implement required species management and monitoring, but increased coordination with range managers would occur to schedule management activities.

4.17.8 Water Resources

4.17.8.1 Affected Environment

Surface Water. Nearly 145 miles of rivers and streams, consisting of 14 miles of rivers and 131 miles of streams, are present on Fort Riley. Streams drain to Wildcat Creek, Republican River or Kansas River. Surface water bodies on Fort Riley are designated for recreation, anticipated aquatic life, consumptive recreation, domestic water supply, industrial water supply, and groundwater discharge.

Water Supply. Groundwater is the primary raw water source at Fort Riley. Fort Riley main post is supplied by eight wells ranging in depth from about 60 to 80 feet. Individual well capacities range from 500 to 1,250 gpm. The total pumping capacity from these wells is 7,500 gpm or 10.8 mgd. Groundwater is withdrawn from aquifers that are recharged by the Republican and Kansas rivers. The existing water supply could support an effective population of more than 63,000 persons, much greater than the installation's current daytime population.

Fort Riley has a water treatment facility with a design capacity of up to 10 mgd. The existing water treatment facilities could support a population of nearly 59,000 persons, which provides ample capacity for growth.

The total treated water storage capacity is 7.25 million gallons. Fort Riley currently stores about 5.5 million gallons of potable water.

Wastewater. Fort Riley is currently served by two advanced WWTP permitted for treating domestic wastewater. One WWTP on Custer Hill was brought on line in 2005. It replaced three separate trickling filter WWTPs that formerly served the three major cantonment areas within the installation. The design flow is about 2.35 mgd, a maximum monthly flow of 2.8 mgd, a maximum daily flow of 3.2 mgd, and a peak instantaneous flow of 7.4 mgd. The second plant began operating in the fall of 2011 and serves the two cantonment areas south of Vinton School Road. The second plant has a design flow of 3.0 mgd and a peak flow of 6 mgd.

Both plants treat domestic wastewater, vehicle maintenance area wastewater, medical facility wastewater, floor-scrubbers wash water, cooling towers heat exchanger coil cleaning wastewater, oily aircraft wash water, purge water from monitoring wells and laundry wastewater.

An industrial wastewater system also is present on Fort Riley on Custer Hill. That system treats wastewater from Tactical Equipment shops, motor pools and other industrial facilities on Fort Riley as well as a large vehicle wash facility. Wastewater from these facilities flows into a lagoon system that consists of a 6-acre reservoir and 4 lagoon cells that vary in size from 4 to nearly 9 acres. Prior to entering the lagoon system, wastewater from the industrial facilities flow through sedimentation basins to remove suspended solids, grit and oil.

***Stormwater*.** Industrial stormwater runoff is discharged at various locations throughout the installation. The locations are listed in the Fort Riley SWPPP and updated in the Annual Stormwater Monitoring Reports. Fort Riley and its construction contractors obtain stormwater permits for construction projects covering 1 or more acres. The Environmental Division, DPW teaches quarterly classes for organizations that perform construction work on Fort Riley to meet stormwater pollution prevention obligations.

4.17.8.2 Environmental Consequences

No Action Alternative

The No Action Alternative would have minor impacts to water resources. No change from existing conditions would occur and all construction, operation, and maintenance projects already under way have obtained the NPDES permit and other applicable permits and are

operating in adherence to their guidance. Training activities would continue, both on ranges and training lands, with adverse impacts including sedimentation into surface waters, however these would continue to be mitigated via the ITAM land rehabilitation program.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to water resources. A loss of up to 8,000 Soldiers and Army civilian employees would reduce traffic in Fort Riley's training areas, roads, and ranges, decreasing the chance of potential surface water impacts. The demand for potable water would also be diminished, and implementation of Alternative 1 would create additional treated wastewater capacity for other uses at the installation.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Implementation of Alternative 2 would have an anticipated minor impact to water resources, as discussed in detail below.

Surface Water. Minor construction would occur as a result of the implementation of Alternative 2, and its potential impacts managed through adherence to existing NPDES and other permits. An increase in training would result in an accompanying increase in the frequency and intensity of usage for existing road, trail, and training areas. This could lead to increased sedimentation and surface water impacts attributable to soils compaction, increased vegetation loss, and increased sheet flow during rain events. Implementation of existing ITAM land rehabilitation measures would prevent these potential impacts from reaching a level of significance.

***Water Supply*.** Potable water capacity at Fort Riley is 10.8 mgd. Based on the average of 100 gpd of potable water use per person it is anticipated that up to 3,000 additional Soldiers would increase potable water demand by up to approximately 300,000 gpd, a demand well within the unused potable water capacity of Fort Riley's wells. When considering the potential dependent populations water usage, the requirements for up to another 456,000 gpd could also be needed if all dependents associated with the stationing action were to live on post. This water demand is still well within the capacity of Fort Riley's wells. As such, this level of growth would not adversely impact Fort Riley's water supply. Fort Riley is currently implementing water resource conservation measures to consume less potable water and to ensure adequate resources in the future. Any new construction and land disturbance over 1 acre would require a stormwater construction permit that would include requirements for protection of stormwater. Domestic and industrial wastewaters generated from additional Soldiers would be treated by Fort Riley's wastewater system, which has sufficient capacity to treat the additional wastewater. Although water demand would increase, Fort Riley has sufficient potable water supply, treatment, and storage capacity to support the increase in demand.

4.17.9 Facilities

4.17.9.1 Affected Environment

The Fort Riley cantonment area includes land uses such housing, community services, recreation, administrative support, industrial, and transition areas. Community services include commercial services such as the Post Exchanges, eating establishments, and theaters, and community facilities such as schools and churches. Community services are scattered around the cantonment area. Recreation and buffer areas generally separate the Family housing areas and community services from the remainder of the cantonment area. The recreation and buffer areas include ball fields and other recreational facilities and open space.

On-post land uses at Fort Riley are functional in nature, have a common purpose, and denote major land uses not minor adjuncts to the primary use. For example, although an industrial land

use area may also contain administration, medical, community facilities, and supply and storage areas, the main use is industrial. Cantonment-type training and ranges land use functions include all types of academic facilities, indoor firing ranges, Army Reserve and National Guard centers, range control towers, ammunition breakdown and distribution sheds, target storage and maintenance buildings, range control buildings, simulator buildings, training courses, and outdoor facilities.

4.17.9.2 Environmental Consequences

No Action Alternative

Impacts to facilities would be negligible under the No Action Alternative. Fort Riley's current facility shortfalls have been prioritized and are seeking or have received Army funding. The installation would continue to implement the Army's FRP at Fort Riley. Environmental analyses of the projects that result from these programs are conducted prior to implementation.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated minor impact on facilities. An increase in the FRP and facilities demolition at Fort Riley would occur as a result of the implementation of Alternative 1. Older, less efficient facilities nearing the end of their life-cycle would be demolished to save the Army money on maintenance and energy requirements. Facility usage and availability for the remaining population would not be affected.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor impact on facilities. Increased Soldier strength of up to 3,000 would be reflected through increased usage of facilities throughout the cantonment area. Increased activities within the training and range areas would be anticipated. Adequate temporary re-locatable facilities currently exist in the cantonment area and could support the stationing of additional Soldiers; however, these facilities were scheduled for turn-in during FY 2012, and they would be needed to accommodate new Soldiers. Increased activities within the training and range areas could be managed with optimal scheduling and utilization. The Real Property Master Plan would require modifications to allow for implementation of Alternative 2. Some additional construction of facilities would be needed to support new Soldiers stationed at Fort Riley. Some of these facilities would include a battalion headquarters facility, company operations facility, motorpool, and barracks. These facilities have been identified as garrison facility shortfalls by installation master planners.

4.17.10 Socioeconomics

4.17.10.1 Affected Environment

Fort Riley is located in northeast Kansas, on the Kansas River, between Junction City and Manhattan. The ROI consists of Geary, Dickinson, Clay, and Riley counties.

Population and Demographics. The Fort Riley population is measured in three different ways. The daily working population is 20,001, and consists of full-time Soldiers and Army civilians employees working on post. The population that lives on Fort Riley consists of 9,900 Soldiers and 10,518 dependents, for an on-post total resident population of 20,418. Finally, the portion of the ROI population related to Fort Riley is 25,439, and consists of Soldiers, civilian employees, and their dependents living off post.

The ROI county population is approximately 135,500. Compared to 2000, the 2010 population increased in Geary, Dickinson, and Riley counties. Population decreased in Clay County from

2000 to 2010 (Table 4.17-3). The racial and ethnic composition of the ROI is presented in Table 4.17-4.

Table 4.17-3. Population and Demographics

Region of Influence Counties	Population 2010	Population Change 2000-2010 (Percent)
Geary	35,000	+ 23
Dickinson	20,000	+ 2.1
Clay	8,500	- 3.3
Riley	72,000	+ 13.2

Table 4.17-4. Racial and Ethnic Composition

State and Region of Influence Counties	Caucasian (Percent)	African American (Percent)	Native American (Percent)	Hispanic (Percent)	Asian (Percent)	Multiracial (Percent)	Other (Percent)
Kansas	78	6	2	11	1	2	0
Geary	60	18	1	12	3	5	1
Dickinson	93	1	0	4	0	2	0
Clay	96	0	0	2	0	1	0
Riley	80	6	1	6	4	3	0

Employment, Income, and Housing. Compared to 2000, the 2009 employment (private nonfarm) increased in the State of Kansas and Geary and Riley counties (Table 4.17-5). Employment decreased in Dickinson and Clay counties. Fort Riley has 3,888 Family quarters: 441 for officers and 3,447 for enlisted personnel. Barracks spaces for unaccompanied personnel total to 6,600. Of those barracks spaces, 95 percent meet the Army's highest standards. Employment, median home value, household income, and poverty level are presented in Table 4.17-5.

Table 4.17-5. Employment, Housing, and Income

State and Region of Influence Counties	2009 Total Nonfarm Employment (Employees)	Employment Change 2000-2009 (Percent)	Median Home Value 2005-2009 (Dollars)	Median Household Income 2009 (Dollars)	Population Below Poverty Level 2009 (Percent)
Kansas	1,146,263	+ 1.6	118,500	47,709	13.20
Geary	8,343	+ 0.1	110,700	44,033	11.40
Dickinson	5,153	- 12.7	92,500	44,307	9.90
Clay	2,529	- 2.5	82,200	44,454	11.50
Riley	20,816	+ 5.9	148,600	40,612	26.30

Schools. Children of military personnel attend school in numerous ROI communities. Fort Riley accounts for 62 percent of students at Geary County USD 475, 25 percent of students at Manhattan-Ogden USD 383, and 6 percent of students at all other schools in the ROI. Based on the number of military dependents they support annually, Geary County USD 475 and

Manhattan-Ogden USD 383 receive major federal funding ($13,627,400 and $361,174; respectively).

Public Health and Safety

- **Police.** The Fort Riley Police Department, a part of the Directorate of Emergency Services, provides law enforcement and property protection at Fort Riley. Police functions include protecting life and property, enforcing criminal law, conducting investigations, regulating traffic, providing crowd control, and performing other public safety duties. City, county, and state police departments provide law enforcement in the ROI.
- **Fire.** The Fort Riley Fire Department, a part of the Directorate of Emergency Services, provides emergency firefighting and rescue services at Fort Riley. Fire prevention is another service provided by the Fort Riley Fire Department. Fire prevention activities include providing fire safety advice and insuring that structures are equipped with adequate fire precautions to ensure that in the event of fire, people can safely evacuate the premises unharmed.
- **Medical.** Fort Riley supports a range of medical services. The Irwin Army Community Hospital provides healthcare services for military personnel, military dependents, and to military retirees and their dependents. Irwin Army Community Hospital services include audiology/speech pathology, dermatology, dietetics, emergency services, family medicine, internal medicine, OB/GYN, occupational therapy, ophthalmology, optometry, orthopedics, otolaryngology, pediatrics, physical therapy, psychiatry, surgery, podiatry, psychology, social work, and substance abuse. Fort Riley also provides dental services and supports a Warrior Transition Battalion.

Family Support Services. The Fort Riley Directorate of FMWR and ACS provide programs, activities, facilities, services, and information to support Soldiers and Families. Services provided at Fort Riley include child care, youth programs, deployment readiness for Families, employment readiness, financial readiness, relocation readiness, exceptional Family member support, Warrior in Transition support, and survivor outreach.

Recreation Facilities. Fort Riley facilities or programs for recreation include fitness centers, swimming pools, athletic fields, golf course, bowling center, outdoor recreation opportunities, sports teams, and a Warrior Zone.

4.17.10.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in beneficial impacts to existing socioeconomic resources. Fort Riley's operations would continue to provide beneficial economic impacts within the region. No additional impacts to housing, public and social services, public schools, public safety, or recreational activities are anticipated.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Economic Impacts. Alternative 1 would result in the loss of up to 8,000 military employees (Soldiers and Army civilian employees), each with an average annual income of $41,830. In addition, this alternative would affect an estimated 4,464 spouses and 7,680 dependent children, for a total estimated potential impact to 12,144 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 20,144.

Based on the EIFS analysis, there would be significant socioeconomic impacts for sales volume, income, employment, and population in the ROI for this alternative. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.17-6. Table 4.17-7 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.17-6. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	10.72	9.16	5.48	8.08
Economic Contraction Significance Value	- 8.95	- 8.19	- 3.60	- 2.81
Forecast Value	- 11.75	- 13.45	- 17.71	- 14.9

Table 4.17-7. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	- $379,642,400	- $378,752,300	- 8,892 (Direct) - 1,177 (Indirect) - 10,069 (Total)	- 20,144
Percent	- 11.75 (Annual Sales)	- 13.45	- 17.71	- 14.9

The total annual loss in volume of direct and secondary sales in the ROI represents an estimated -11.75 percent change in the current total sales volume of $3.23 billion within the ROI. It is estimated that state tax revenues would decrease by approximately $23.87 million as a result of the loss in revenue from sales reductions. Some counties within the ROI supplement the state sales tax of 6.3 percent by varying percentages, and these additional local tax revenues would be lost at the county and local level. Regional income would decrease by 13.45 percent. While 8,000 Army Soldier and government civilian employee positions would be lost within the ROI, EIFS estimates another 892 military contract service jobs would be lost, and an additional 1,177 job losses would occur indirectly as a result of reduced demand for goods and services. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 10,069 jobs, or a -17.71 percent change in regional non-farm employment. The total number of employed positions (non-farm) in the ROI is estimated to be 56,842. A significant population reduction of 14.9 percent within the ROI is anticipated as a result of this alternative. Of the approximately 135,500 people (including those residing on Fort Riley) that live within the ROI, 20,144 military employees and their dependents would no longer reside in the area following the implementation of Alternative 1. This could lead to a decrease in demand for housing, and increased housing availability in the region. This would lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes civilian and military employees and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.17-8 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.17-8. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $274,958,832 (Local) - $512,672,096 (State)	- $370,596,376	- 8,605 (Direct) - 751 (Indirect) - 9,356 (Total)
Percent	- 8.48 (Total Regional)	- 13.16	- 16.46

The total annual loss in volume of direct and secondary sales in the ROI represents an estimated -8.48 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 3.27 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would decrease by approximately $32.3 million as a result of the loss in revenue from sales reductions, which would be $8.43 million less in lost state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to decrease by 13.16 percent, slightly less than the 13.45 percent reduction projected by EIFS. While 8,000 Army Soldier and government civilian positions would be lost within the ROI, RECONS estimates another 605 military contract and service jobs would be lost, and an additional 751 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 9,356 jobs, or a -16.46 percent change in regional employment, which would be 1.25 percentage points less than projected by the EIFS model.

When assessing the results together, both models estimate a similar net reduction of economic activity within the ROI.

Population and Demographics. Fort Riley anticipates a substantial reduction in military population throughput as a result of the implementation of Alternative 1.

Housing. Alternative 1 would increase the availability of barracks space for unaccompanied personnel and Family quarters. Those outcomes would likely decrease the off-post demand for rentals and purchases of housing. Fort Riley anticipates long-term, significant adverse affects in Junction City, Manhattan, and in the smaller communities of the ROI.

Schools. Fort Riley anticipates the potential for significant adverse impact to the Geary County USD 475 under Alternative 1. That school district has invested in school facilities to support the recent population growth of Fort Riley that resulted from the 2005 BRAC action and other Army stationing actions. Adverse impacts are likely for the Manhattan-Ogden USD 383 also, where that school district also confronted a BRAC-related increase in the population of school children.

Public Health and Safety. As a result of Alternative 1, the anticipated population decrease at Fort Riley would likely reduce the demand for law enforcement services, fire and emergency services, and medical care services on and off post. Fort Riley anticipates less than significant impacts to public health and safety under the Proposed Action.

Family Support Services. Under Alternative 1, Fort Riley anticipates a reduced demand for FMWR and ACS programs on post. The demand for Family support services off post would

likely decrease also. Fort Riley anticipates less than significant impacts to Family support services under the Proposed Action.

Recreation Facilities. Use of recreation facilities on post would likely decline under Alternative 1. Fort Riley anticipates that utilization decreases would be minor or moderate.

Environmental Justice. Under Alternative 1, Fort Riley anticipates no disproportionate adverse impact to minorities, economically disadvantaged populations, or children. Job losses would likely be felt across the ROI, affecting all income levels and many economic sectors.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Economic Impacts. Alternative 2 would result in the increase of up to 3,000 Soldiers, each with an average annual income of $41,830. In addition, this alternative would affect an estimated 1,674 spouses and 2,880 dependent children, for a total estimated potential impact to 4,554 dependents. The total population of military employees and their dependents directly affected by Alternative 2 would be projected to be 7,554.

Based on the EIFS analysis, there would be no significant impacts for sales volume, income, or population. There would be significant impacts for employment. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.17-9. Table 4.17-10 presents the projected economic impacts to the region for Alternative 2 as assessed by the Army's EIFS model.

Table 4.17-9. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 2

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	10.72	9.16	5.48	8.08
Economic Contraction Significance Value	- 8.95	- 8.19	- 3.60	- 2.81
Forecast Value	4.40	5.04	6.64	5.57

Table 4.17-10. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$142,365,900	$142,032,100	3,334 (Direct) 442 (Indirect) 3,776 (Total)	7,554
Percent	4.40 (Annual Sales)	5.04	6.64	5.57

The total annual gain in volume of direct and secondary sales in the ROI represents an estimated 4.40 percent change from the current total sales volume of $3.23 billion within the ROI. It is estimated that state tax revenues would increase by approximately $4.94 million as a result of the gain in revenue from sales increases. Some counties within the ROI supplement the state sales tax of 6.3 percent by varying percentages, and these additional local tax revenues would be gained at the county and local level. Regional income would increase by 5.04 percent. While 3,000 Soldiers would be gained within the ROI, EIFS estimates another 334 military contract service jobs would be gained, and an additional 442 jobs would be created

from increases in demand for goods and services in the ROI indirectly. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 3,776 jobs, or a 6.64 percent change in regional employment. The total number of employed positions (non-farm) in the ROI is estimated to be 56,842. A population increase of 5.57 percent within the ROI would be anticipated as a result of this alternative. Of the approximately 135,500 people (including those residing on Fort Riley) that live within the ROI, 7,554 Soldiers and their dependents would be begin to reside in the area following the implementation of Alternative 2. This would lead to an increase in demand for housing, and decreased housing availability in the region. This would lead to a slight increase in median home values. It should be noted that this estimate of population increase includes civilian and military employees and their dependents.

Table 4.17-11 shows the total projected economic impacts, based on the RECONS model, that would be anticipated to occur as a result of the implementation of Alternative 2.

Table 4.17-11. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment
Total	$103,109,562 (Local) $192,252,036 (State)	$138,973,641	3,227 (Indirect) 282 (Indirect) 3,509 (Total)
Percent	3.18 (Total Regional)	4.93	6.17

The total annual gain in volume of direct and secondary sales in the ROI represents an estimated 3.18 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 1.22 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would increase by approximately $12.11 million as a result of the gain in revenue from sales reductions, a large increase ($7.17 million) in additional state sales tax revenue in comparison to the EIFS model. Regional income is projected by RECONS to increase by 4.93 percent, slightly less than the 5.04 percent increase projected by EIFS. While 3,000 Soldiers would be gained within the ROI, RECONS estimates another 227 military contract and service jobs would be gained, and an additional 282 jobs would be created indirectly from increased demand for goods and services in the ROI. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 3,509 jobs, or a 6.17 percent change in regional non-farm employment, which would be 0.47 percentage points less than projected by the EIFS model.

When assessing the results together, both models predict similar net increases of economic activity within the ROI.

Population and Demographics. Under Alternative 2, Fort Riley anticipates a minor increase in military population throughput.

Housing. Alternative 2 would likely add to the pool of Soldiers that want to live on post. Barracks space for unaccompanied personnel and quarters for Families would be available to a smaller percentage of Soldiers in the total Fort Riley population. As a result, the demand for off-post rentals and purchases of housing would likely increase. Fort Riley anticipates long-term, minor beneficial impacts in Junction City, Manhattan, and in the smaller communities of the ROI.

Schools. Fort Riley anticipates the potential for minor impacts to the Geary County USD 475 and the Manhattan-Ogden USD 383 as a result of implementation of Alternative 2. Both school

districts have integrated higher numbers of students into their schools due to the BRAC-related population growth of Fort Riley in recent years. Alternative 2 would further challenge local school districts to a minor degree.

Public Health and Safety. Under Alternative 2, the anticipated population increase at Fort Riley would likely increase the demand for law enforcement services, fire and emergency services, and medical care services on and off post. Fort Riley anticipates minor impacts to public health and safety under the Proposed Action.

Family Support Services. Under Alternative 2, Fort Riley anticipates an increased demand for FMWR and ACS programs on post. The demand for Family support services off post would likely increase also. Fort Riley anticipates minor impacts to Family support services under the Proposed Action.

Recreation Facilities. Use of recreation facilities on post would likely increase under Alternative 2. Fort Riley anticipates that utilization increases would be minor. Some facilities could become crowded and less user-friendly during peak use hours.

Environmental Justice. Under Alternative 2, Fort Riley anticipates no disproportionate adverse impact to minorities, economically disadvantaged populations, or children. The impacts of the anticipated growth of Fort Riley would be felt throughout the ROI and across all populations.

4.17.11 Energy Demand and Generation

4.17.11.1 Affected Environment

***Electrical System*.** A private electric utility company provides primary electrical power to Fort Riley. All other power distribution lines, transformers, and associated equipment are owned, operated, and maintained by the installation. The electrical transmission and distribution system consists of both overhead and underground lines providing adequate coverage to areas on the installation. Some remote training areas on the installation are supplied electric power through independent rural electrical companies.

Natural Gas and Propane. Natural gas is supplied to Fort Riley via two parallel pipelines measuring 8 inches and 10 inches in diameter. The Fort Riley distribution system for natural gas consists of pipe sizes ranging from 2 to 12 inches in diameter and extends from the gas service main to all required locations within the cantonment areas. The overall condition of the distribution system is good and is adequate for existing demands. Propane is used to heat remote locations such as training areas at Fort Riley, where very small amounts of liquid propane gas are used.

4.17.11.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in negligible energy demand and generation impacts. Fort Riley's ranges and garrison area would continue to use and generate the same types and amounts of utility consumption for which the installation is already managing. Maintenance of existing utility systems would continue.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to energy demand due to the reduction in the on-post usage and requirement for energy associated with the reduction in Soldiers. The reduction in Soldiers, civilians, and dependents would allow the installation to demolish energy inefficient outdated facilities; however, Fort Riley would continue to search for

innovative ways to conserve energy and improve its energy efficiency, as mandated by law and ARs for energy conservation.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated a minor adverse impact to energy demand due to the addition of up to 3,000 Soldiers and their Family members on post and their associated energy usage and requirements. Fort Riley's existing energy infrastructure has sufficient excess capacity, diversity, and scalability to readily accommodate this growth. Fort Riley would implement energy conservation measures to decrease its per capita consumption of energy and increase the installations energy efficiency.

4.17.12 Hazardous Materials and Hazardous Waste

4.17.12.1 Affected Environment

The affected environment for the Proposed Actions includes the use, storage, transport, and disposal of hazardous materials and waste at Fort Riley. This includes hazardous materials and waste from USTs and ASTs, pesticides, LBP, asbestos, PCBs, radon, and UXO. Fort Riley operates under a HWMP that manages hazardous waste to promote the protection of public health and the environment. Army policy is to substitute nontoxic and nonhazardous materials for toxic and hazardous ones; ensure compliance with local, state, and federal hazardous waste requirements; and ensure the use of waste management practices that comply with all applicable requirements pertaining to generation, treatment, storage, disposal, and transportation of hazardous wastes. The program reduces the need for corrective action through controlled management of solid and hazardous waste (USACE, 2002).

4.17.12.2 Environmental Consequences

No Action Alternative

Overall, negligible impacts are anticipated under the No Action Alternative. There would be no change in Fort Riley's management of hazardous materials, toxic substances, hazardous waste, or contaminated sites. Fort Riley would continue to manage existing sources of hazardous waste in accordance with the HWMP.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated minor impact to hazardous materials and hazardous wastes. In the short term, there would be an increase in the demolition of outdated and no longer needed facilities, which would increase the volume of solid waste generated. In addition, an increase in asbestos containing materials and LBP disposal is anticipated until facility reduction is completed. Construction workers and Army personnel would take measures to dispose of materials in accordance with regulatory requirements and installation management plans.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Negligible short- and long-term impacts from hazardous materials and waste would be anticipated with a gain of up to 3,000 Soldiers. An increase in the use of hazardous chemicals could be seen in the cantonment and training and range areas. Any demolition, renovation, and construction would most likely result in an increase in the generation of asbestos, lead-contaminated wastes, and other hazardous waste, as well as an increase in the use of pesticides for any new facilities. The increase in these wastes would not result in adverse impacts because the wastes would be managed in accordance with applicable regulations. The

hazardous waste disposal facilities would be adequate to manage the increase in hazardous waste.

4.17.13 Traffic and Transportation

4.17.13.1 Affected Environment

Fort Riley is located in northeastern Kansas, approximately 55 miles west of Topeka, and 115 miles west of Kansas City. The ROI of the affected environment for traffic and transportation aspects of the Proposed Action include Fort Riley, and several neighboring counties, to include Riley, Geary and Clay counties, and the communities therein, to include the City of Manhattan, and the towns of Junction City and Ogden. Major road routes in the region include I-70, an east-west interstate highway that passes less than 0.5 miles to the south of the cantonment area. Other major routes in the area include U.S. Route 77, and Kansas State Routes 18, 57, and 82.

4.17.13.2 Environmental Consequences

No Action Alternative

Negligible impacts are anticipated under the No Action Alternative. Fort Riley's transportation system provides adequate LOS for its users and military and civilian members of the Fort Riley community.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to traffic and transportation systems. As fewer Soldiers and their Family members are left on post, it is anticipated that traffic congestion would be diminished and travel time would decrease. The roads would continue to be maintained and LOS for on- and off-post commuters would improve as traffic volume decreased.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have anticipated minor short and long-term impacts on traffic and transportation systems. The increase in off-post traffic would have a minimal impact on traffic in the community overall and would not be anticipated to result in a decrease in the LOS of the road network leading to the installation from off post. Implementation of Alternative 2 would, however, add congestion particularly during peak morning and afternoon travel periods. This increase in population would also have a minor impact on the traffic volume on the installation, and on some of the installation's interior routes.

4.17.14 Cumulative Effects

Region of Influence

The ROI for this cumulative impact analysis of Army 2020 realignment at Fort Riley encompasses four counties in the state of Kansas, unless otherwise stated in the analysis below. Manhattan and Junction City are the largest cities within the ROI. Manhattan is a center for education, healthcare, government, retail business, and manufacturing. Junction City is a center for government and commercial activities in support of Fort Riley. Fort Riley has long been a key component of the ROI economy, employing thousands of Soldiers and civilian employees. Fort Riley has been in operation supporting the Army since 1853.

There are numerous planned or proposed actions within the ROI that have the potential to cumulatively add impacts to Army Force 2020 alternatives. These actions are either in progress or reasonably could be initiated within the next 5 years. A number of the Army's proposed projects have been previously identified in the installation's Real Property Master Planning

Board and are programmed for future execution. A list of projects below presents some of the projects which may add to the cumulative impacts of the implementation of Army 2020 realignment alternatives.

Fort Riley Projects (Past, Present, and Reasonably Foreseeable):

- Battalion and Brigade Complexes;
- Multi-Purpose Machine Gun Range;
- Infantry Platoon Battle Course;
- Extended Range Multi-Purpose UAS Facilities;
- Roads and Streets Infrastructure Improvements;
- Network Enterprise Center Headquarters; and
- Hospital Renovation or Demolition.

Other Agency (DoD and non-DoD) Actions (Past, Present, and Reasonably Foreseeable):

- National Agro and Bio-Defense Facility in Manhattan; and
- Kansas State Route 18 Highway Improvements.

Fort Riley anticipates a range of cumulative effects resulting from the implementation of the Proposed Action and alternatives. Cumulative impacts for each alternative are as follows:

No Action Alternative

Beneficial through minor adverse cumulative impacts would be anticipated from implementing the No Action Alternative. Under the No Action Alternative, no changes in military authorizations, or local environmental conditions would be anticipated. Installation facility shortages and excesses would remain at their currently planned levels without additional stationing or force reductions. The Army would continue to implement some facilities reductions of outdated/unused facilities. Highway improvements by the Kansas Department of Transportation would continue, as planned. Operations of Fort Riley would continue to have a beneficial cumulative impact on socioeconomics at the current levels.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Cumulative impacts as a result of the implementation of Alternative 1, range from beneficial impacts to significant adverse impacts to socioeconomics. When viewed in conjunction with other past, present and reasonably foreseeable projects, the overall cumulative effects of Alternative 1 are projected to be either beneficial or no more than negligibly adverse impacts for all VECs except socioeconomics, which would be anticipated to have cumulatively significant adverse impacts.

Cumulative beneficial effects to air quality, noise, biological resources, water resources, energy demand and generation, and traffic and transportation would be anticipated. Reduced military training and less population pressure would produce those beneficial effects which would remain cumulatively beneficial environmental effects even when considering the impacts of other future projects, such as the Kansas State Route 18 Highway project.

As a result of Alternative 1, the Army anticipates significant cumulative adverse impacts to the socioeconomics. State-wide, off-post unemployment has risen from 4.0 percent to 5.9 percent from March 2008 to September 2012 (USDL, 2012). The force reduction proposed under Alternative 1 would cause a decline in employment within the ROI, and likely have broader effects in the state. Economic impacts would remain significant when considering reasonably foreseeable future projects and initiatives in the ROI.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Cumulative impacts are projected to range from beneficial impacts to socioeconomic conditions to minor adverse impacts. The following VEC areas are anticipated to experience either negligible or minor adverse cumulative impact as a result of the implementation of Alternative 2: air quality, airspace, cultural resources, noise, soil erosion, biological resources, wetlands, water resources, facilities, energy demand and generation, land use conflict and compatibility, hazardous materials and hazardous waste, and traffic and transportation. Fort Riley anticipates that the absorption of 3,000 additional Soldiers would cumulatively have little adverse impact in the region due to the existing infrastructure, management systems, and support mechanisms at Fort Riley and within the region. Existing and future planned transportation infrastructure can accommodate future population growth, as can the utilities and water treatment systems in the ROI. Impacts of proposed projects within the ROI would not be anticipated to result in decline of any federally-listed or sensitive species. Due to the ability of the local ecosystems and habitats to recover quickly, only minor impacts to natural resources and soils are anticipated. Cumulatively, impacts to air quality would be minor when considering roadway improvements and other projects in conjunction with the stationing of additional Soldiers at Fort Riley. No NAAQS thresholds would be breached or cause non-attainment issues within the AQCR. The growth associated with Alternative 2 in addition to other projects within the ROI would have a beneficial cumulative impact on socioeconomics.

4.18 SCHOFIELD BARRACKS AND U.S. ARMY GARRISON HAWAI'I

4.18.1 Introduction

The U.S. Army Garrison, Hawai`i (USAG-HI) is located on the islands of O'ahu and Hawai`i. USAG-HI is headquartered at Wheeler Army Airfield, approximately 25 miles northwest of the state capital of Honolulu, and maintains approximately 22 responsibility areas (sub-installations). The major units supported by the garrison include the 25th Infantry Division and its subordinate units to include the 2/25th SBCT, the 3/25th IBCT, and elements of the 25th ID CAB; the 8th Theater Sustainment Command and its subordinate units; the U.S. Army Pacific Command; the 45th Corps Support Group (Forward); and a variety of combat support and sustainment units. USAG-HI has the capability of hosting a variety of joint training exercises and provides the Pacific Command with the ability to train and deploy Soldiers rapidly from a forward positioned location.

Schofield Barracks Military Reservation (SBMR) is the main installation that would be impacted by the reduction of a BCT or potential gain in combat support units being considered. To a lesser extent Fort Shafter may be minimally impacted by small decrements or gains in Command and Control and combat support units. SBMR and Fort Shafter support administrative functions and garrison operations (office functions, vehicle and equipment maintenance, Soldier recreation and living quarters, etc.). SBMR includes the Schofield Barracks Main Post (SBMP), South Range, and Schofield Barracks East Range (SBER); however, throughout the analysis areas are identified by their more specific description (South Range and SBER), when appropriate. Troops are housed on main post at SBMR; and training would occur on all of these sites. Training would be conducted at a number of other training areas in Hawai`i, including Dillingham Military Reservation (DMR), Kahuku Training Area (KTA), Kawailoa Training Area (KLOA), and Wheeler Army Airfield on O'ahu. On the Island of Hawai`i, Combat Support units proposed for realignment as a result of implementation of Alternatives 1 and 2 would continue to support combat maneuver unit training rotations at Pohakuloa Training Area (PTA), which includes the West PTA and Bradshaw Army Airfield. Combat maneuver units conduct fire training exercises, indirect fires training, and aviation gunnery activities at PTA.

SBMR, South Range, and SBER accommodate Soldier weapons qualification activities and small unit maneuver training tasks, as well as provide the garrison infrastructure to house and administer Army units. Although no live fire currently occurs at KTA, training with Short Range Training Ammunition occurs here. No LFX are conducted on SBER; all exercises are limited to blank and pyrotechnic ammunition. The Army has established a 1,000-foot noise buffer zone during the day and a 2,000-foot noise buffer zone at night between the range and Wahiawa residential areas. The use of small arms blank ammunition is not authorized on select SBER ranges between 6 p.m. and 6 a.m.

Wheeler Army Airfield is in central O'ahu and is bordered by SBMR and SBER. Wheeler Army Airfield consists of 1,369 acres and provides administration, some housing requirements, maintenance, training, and flight facilities for military aviation units. 25th Infantry Division aviation support currently consists of two aviation battalions consisting of 108 helicopters, 280 military trucks, fuelers and service vehicles, and approximately 1,000 Soldiers stationed there.

KLOA consists of 23,348 acres, and is used primarily for helicopter training. Access to KLOA is limited due to unimproved roads, steep terrain, and dense vegetation. The training area is used by light infantry for mountain and jungle warfare training. Aviation units support insertions and conduct aerial maneuvers at the training site.

DMR is a 664-acre training site and has an active joint-use airfield. Portions of the reservation have been leased by the Hawai`i Department of Transportation, for civilian light aircraft use.

Approximately 354 acres are suitable for maneuver and field training. Infantry and other combat support units use DMR for small unit training exercises. Units use blank ammunition to rehearse their mission essential tasks.

KTA is a 9,398-acre maneuver site that is located on the northern end of O'ahu. It's the largest contiguous ground maneuver training area on O'ahu. The northern portion of KTA supports all tactical maneuver training scheduled on KTA. Training includes jungle warfare training, pyrotechnics, and air support training. KTA accommodates training exercises primarily through company level though some limited battalion training tasks can also be supported. A number of small drop zones are located on KTA and can be used to conduct small unit parachute drops.

PTA is the largest military training area in Hawai`i and consists of over 130,000 acres. The ordnance impact area consists of approximately 51,000 acres and extends from central PTA to the southern boundary of the training area. This area can accommodate the firing of all USAG-HI's training munitions and is used by other services to conduct live-fire training events. PTA supports large unit maneuvers (battalion and brigade) and provides a venue for combat units to conduct integrated live-fire and maneuver training with other types of units in an operational scenario. Currently, the Army is conducting an EIS to modernize training ranges to support collective live-fire and maneuver infantry training.[2] That EIS assumes that the numbers of Soldiers training at PTA would not exceed historically authorized levels and that, therefore, the traffic going to the installation would not change. If a need arose to increase the numbers of Soldiers traveling to PTA, it would be subject to further, site-specific NEPA analysis.

Attainment of operational readiness of Army units in Hawai'i is not currently dependent on the use of Makua Military Reservation (MMR) for live-fire exercises. Because MMR is not currently available for live-fire training, additional Army units, if stationed in Hawai'i, would need to perform live-fire training at other ranges. Commanders of newly stationed units might choose to use MMR for live-fire training if the range became available for that use in the future. For purposes of stationing decisions made as part of this analysis, it is assumed that MMR is not currently available for live-fire training purposes.

The locations of USAG-HI major training areas and their geographic locations, as well as the geographic location of PTA on the Big Island of Hawai'i are depicted in Figure 4.18-1 (O'ahu sites), and Figure 4.18-2 (Hawai'i sites).

4.18.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, USAG-HI does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 8,000 Soldiers and Army Civilians) or Alternative 2 (Installation gain of 1,500 Soldiers) on either O'ahu or Hawai'i. USAG-HI does anticipate significant adverse economic impacts to employment and population with the implementation of Alternative 1. Table 4.18-1 summarizes the anticipated impacts to VECs from each alternative at SBMR and other locations on the Island of O'ahu. Table 4.18-2 summarizes the level of anticipated impacts from the implementation of stationing alternatives at PTA on the Island of Hawai'i.

[2] USAG-HI has published a Draft PEIS to evaluate potential impacts of range and Garrison training support infrastructure modernization (USAG-HI, 2011). Impacts of this PEIS are considered as part of the "reasonably foreseeable" cumulative effects analysis at the end of this section. No final decisions to implement alternatives in the PEIS have been made at this time.

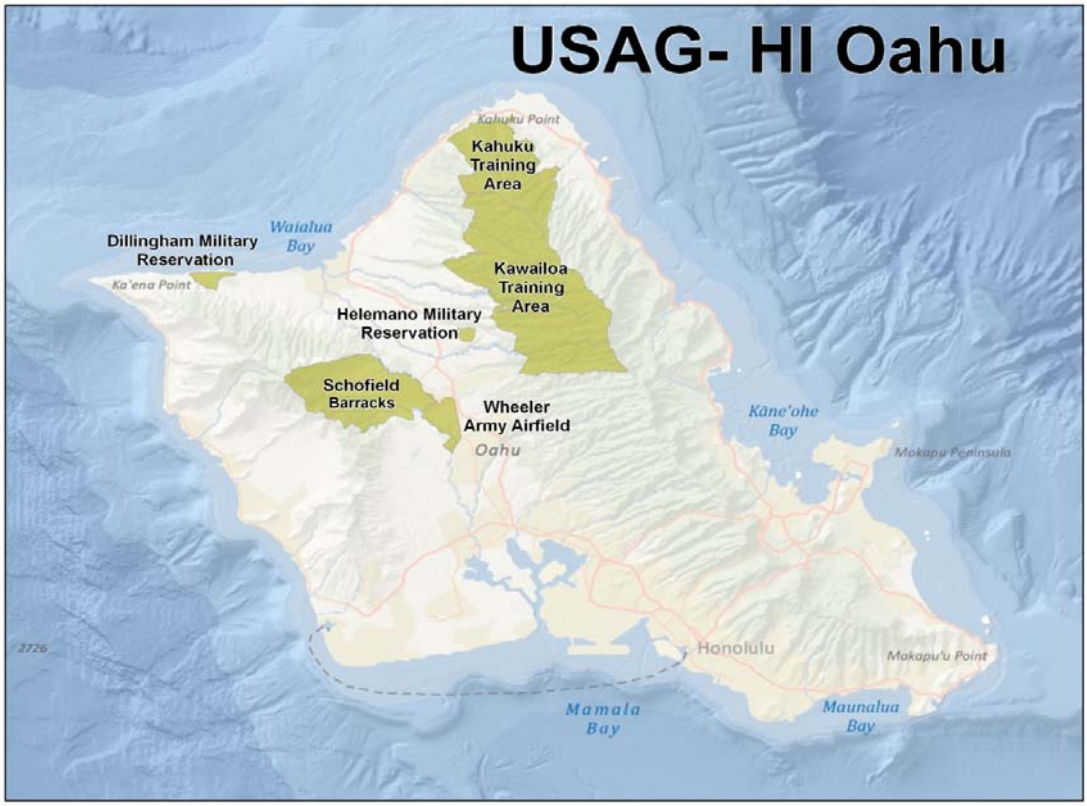

Figure 4.18-1. Schofield Barracks Military Reservation, O'ahu Training Sites

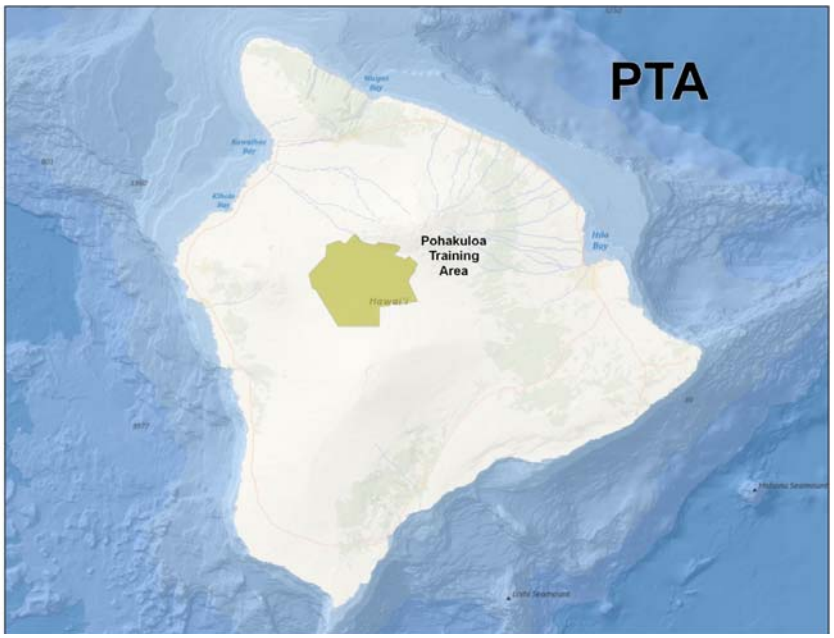

Figure 4.18-2. Pohakuloa Training Area Site

Table 4.18-1. USAG-HI (O'ahu) Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 8,000	Alternative 2: Growth of up to 1,500
Air Quality	Less than Significant	Beneficial	Less than Significant
Airspace	Minor	Beneficial	Minor
Cultural Resources	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Noise	Significant but Mitigable	Beneficial	Significant but Mitigable
Soil Erosion	Significant but Mitigable	Beneficial	Significant but Mitigable
Biological Resources	Significant but Mitigable	Beneficial	Significant but Mitigable
Wetlands	Minor	Minor	Minor
Water Resources	Minor	Minor	Significant but Mitigable
Facilities	Minor	Beneficial	Significant but Mitigable
Socioeconomics	Minor	Significant	Less than Significant
Energy Demand and Generation	Less than Significant	Beneficial	Minor
Land Use Conflict and Compatibility	Less than Significant	Beneficial	Minor
Hazardous Materials and Hazardous Waste	Minor	Beneficial	Less than Significant
Traffic and Transportation	Significant but Mitigable	Beneficial	Significant but Mitigable

Table 4.18-2. USAG-HI (Pohakuloa Training Area) Valued Environmental Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 8,000	Alternative 2: Growth of up to 1,500
Air Quality	Less than Significant	Beneficial	Less than Significant
Airspace	Minor	Beneficial	Minor
Cultural Resources	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Noise	Significant but Mitigable	Beneficial	Significant but Mitigable
Soil Erosion	Significant but Mitigable	Beneficial	Significant but Mitigable
Biological Resources	Significant but Mitigable	Beneficial	Significant but Mitigable

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 8,000	Alternative 2: Growth of up to 1,500
Wetlands	Negligible	Minor	Negligible
Water Resources	Minor	Beneficial	Less than Significant
Facilities	Minor	Beneficial	Significant but Mitigable
Socioeconomics	Minor	Negligible	Negligible
Energy Demand and Generation	Less than Significant	Beneficial	Minor
Land Use Conflict and Compatibility	Less than Significant	Beneficial	Minor
Hazardous Materials and Hazardous Waste	Minor	Beneficial	Less than Significant
Traffic and Transportation	Less than Significant	Beneficial	Less than Significant

4.18.2 Air Quality

4.18.2.1 Affected Environment

The ROI for air quality is dependent upon the pollutant and source of emission under consideration. The ROI for a regional secondary pollutant such as O_3 is generally the entire island (O'ahu or Hawai'i) and is not emitted directly but transformed through chemical reactions in the atmosphere; whereas, the ROI for primary pollutants may extend no more than a few miles away from the source (depending on the source and meteorological conditions). Primary pollutants may be diluted and dispersed by wind, resulting in lower pollutant concentrations at greater distances away from the source.

Major air emission sources in Hawai'i include the burning of sugar cane and emissions from volcanic activity and geothermic development. Hawai`i operates nine ambient air quality monitoring stations on O'ahu, and five stations on Hawai`i. Each air quality monitoring station is located at or near urban areas and each in coastal regions; many of which function to either monitor volcanic emissions or industrial activities. None of the nine stations are located near Army training areas.

Air pollution levels in Hawai`i are generally low due to the state's small size and location; therefore, upwind areas do not significantly contribute to background pollution levels, and locally generated air pollutants are generally transported offshore and away from land areas. Intermittent high concentrations of suspended PM can occur in some areas, primarily due to agricultural burning or fireworks use during holiday celebrations. The entire state is classified as being in compliance with federal ambient air quality standards, and thus is designated as an attainment area.

Hawai`i has adopted ambient air quality standards that are in some areas more stringent than the comparable federal standards and address pollutants that are not covered by federal ambient air quality standards. Hawai`i has established significant ambient air concentration thresholds and criteria for HAPs (Hawai`i Administrative Rules Title 11, Chapter 60.1, Chapter

179). These are applied under the permit review process for emission sources that require state or federal air quality permits. These thresholds and criteria are found in Table 4.18-3.

Table 4.18-3. State and National Ambient Air Quality Standards Applicable in Hawai'i

Pollutant	Averaging Times	State Standards	Federal Standards	Units
Carbon Monoxide	1-hour	9	35	ppm
		10,000	40,000	µg/m³
	8-hour	4.4	9	ppm
		5,000	10,000	µg/m³
Nitrogen Dioxide	Annual (Arith. Mean)	0.04	0.053	ppm
		70	100	µg/m³
Sulfur Dioxide	3-hour	0.5	0.5	ppm
		1,300	1,300	µg/m³
	24-hour	0.14	0.14	ppm
		365	365	µg/m³
	Annual (Arith. Mean)	0.03	0.03	ppm
		80	80	µg/m³
Ozone	1-hour	-	0.12	ppm
	8-hour	0.08	0.08	ppm
		157	157	µg/m³
Particulate Matter (less than or equal to 10 micrometers)	24-hour	150	150	µg/m³
	Annual (Arith. Mean)	50	Revoked	µg/m³
Lead	Quarterly Average	1.5	1.5	µg/m³
Hydrogen Sulfide	1-hour	0.025	-	ppm
		35	-	µg/m³
Particulate Matter (less than or equal to 2.5 micrometers)	24-hour	-	35	µg/m³
	Annual (Arith. Mean)	-	15	µg/m³

Source: HDOH, 2001
ppm = parts per million; µg/m3 = micrograms per cubic meter
Notes:

- All standards, except the national PM_{10} and $PM_{2.5}$ standards, are based on measurements corrected to 25 degrees Celsius and 1 atmosphere pressure.
- The national PM_{10} and $PM_{2.5}$ standards are based on direct flow volume data without correction to standard temperature and pressure.
- The "10" in PM_{10} and the "2.5" in $PM_{2.5}$ are not particle size limits; these numbers identify the particle size class (aerodynamic diameter in microns) collected with 50 percent mass efficiency by certified sampling equipment. The maximum particle size collected by PM_{10} samplers is about 50 microns. The maximum particle size collected by $PM_{2.5}$ samplers is about 6 microns.
- For noncarcinogenic compounds, an 8-hour average concentration equal to 1 percent of the corresponding 8-hour threshold level value adopted by the Occupational Safety and Health Administration (OSHA).
- For noncarcinogenic compounds, an annual average concentration equal to 1/420 (0.238 percent) of the 8-hour threshold level value adopted by OSHA.
- For noncarcinogenic compounds for which there is no OSHA-adopted threshold level value, the Director of Health is authorized to set ambient air concentration standards on a case-by-case basis so as to avoid unreasonable endangerment of public health with an adequate margin of safety.
- For carcinogenic compounds, any ambient air concentration that produces an individual lifetime excess cancer risk of more than 10 in 1 million assuming continuous exposure for 70 years.

The closest monitoring station is located approximately 6 miles away from Schofield at Pearl City. Recent monitoring data from that source show that ambient air quality records are generally well within state and federal ambient air quality standards. In recent years, concentrations of PM measured at 10 and 2.5 µm (PM_{10}) and ($PM_{2.5}$) have exceeded state or federal 24-hour $PM_{2.5}$ standards on 1 to 2 days per year; however, at no time in these 3 years was the federal 24-hour PM_{10} standard exceeded.

Schofield Barracks is a "major source" and maintains a Title V air permit. Individual emissions sources that contribute to the Schofield Barracks' overall status include boiler systems, generators for backup power, and various equipment operations,

The closest air quality monitoring station is located on the south side of O'ahu. The major military activities contributing to air emissions at DMR include vehicle traffic and aircraft flight operations. The Army only uses the airfield at DMR for approximately 3 percent of total annual flight operations (mainly for refueling and rearming OH-58D helicopters during flight operations). The airfield is primarily used by private aircraft. Live-fire activities are not conducted at DMR; however, the Army does use blank ammunition and ground-based smoke devices during training exercises. Meteorological conditions at DMR are monitored from a weather station located between DMR and MMR.

The primary sources of air emissions at these locations include vehicle traffic, aircraft flight operations (helicopters mainly), and training munitions. These activities are presently intermittent at both KTA and KLOA. Most training at KLOA involves dismounted Soldier maneuver and helicopter operations. The Army operates a remote weather station at KTA that is used primarily to monitor conditions in the context of fire management. Historical data show an average wind speed of 13.7 mph and a maximum average hourly wind speed of 34 mph. The hourly average wind speeds exceeded 9.9 mph approximately 75 percent of the time and (specifically at KTA) exceeded the 15 mph threshold commonly associated with wind erosion processes approximately 40 percent of the time.

4.18.2.2 Environmental Consequences

No Action Alternative

Under this Alternative, the impacts from Army activities at Schofield Barracks and O'ahu training and at PTA would remain less than significant. Conditions described in the affected environment would not change, other than as discussed below as a part of pre-existing trends and the ongoing actions. Title V permit conditions and air quality would continue to be monitored to ensure compliance with air emissions standards, but no changes to emission sources are anticipated, other than those mandated by maintenance, replacement, or elimination of sources as they age or are removed from service. The impacts from Army activities at Schofield Barracks and O'ahu training areas and at PTA would remain less than significant. No additional cantonment construction is required in USAG-HI other than that which is currently ongoing or planned. With the limited amount of future construction projects, the garrison anticipates less than significant impacts at both PTA and on O'ahu. The garrison has critical facilities available to support existing units' living, administrative, and vehicle maintenance requirements. Some construction, demolition, and renovation would continue to occur to support maintenance and management of facilities on an as needed basis in the future. The impacts from range infrastructure construction, live-fire training, and maneuver training would remain less than significant.

Less than significant impacts are anticipated from continued actions the Army is taking in Hawai'i under the No Action Alternative, although adverse impacts to air quality are anticipated from both mobile and stationary emission sources in addition to naturally occurring activities. It

is not anticipated that continuation of the status quo would result in a violation of air quality standards in Hawai'i or on O'ahu, or cause surrounding communities to violate such standards.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The loss of a brigade and other support units would result in beneficial impacts to air quality on O'ahu and Hawai'i as a result of the implementation of Alternative 1. There would be additional near-term minor impacts to air quality from an increase in demolition and a more rapid implementation of the Army's FRP. The impacts associated with live-fire training are anticipated to also be beneficial as there would be less threat of wildfire and therefore less resultant air emissions from wildfire. Long-term effects from reduction of units within USAG-HI would include a decrease in stationary source emissions such as from boiler units and generators. Localized emissions from the live fire of small arms weapons would decrease; however, rifles and machine guns generally have very low emissions rates.

A decrease in maneuver activities would occur resulting in a decrease of opacity or fugitive dust emissions, and vehicle emissions, including PM, CO, and O_3.

In summary, an overall reduction in both stationary and mobile source emissions from reduction in training and construction would occur, and impacts on the islands of O'ahu and Hawai'i would be beneficial to air quality. GHG emissions would also decrease.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be a less than significant impact on air quality in the airsheds surrounding the islands of O'ahu and Hawai'i. While adverse impacts to air quality are anticipated from additional mobile and stationary air emission sources, additional emissions would not result in a violation of air quality standards in Hawai'i or an exceedence of SBMR's current Title V permit.

Short-term and long-term impacts are anticipated as a result of this stationing alternative. SBMR's main post does not currently have additional vacant space and housing needed to support an additional 1,500 Soldiers and their Families. Army Housing in Hawai'i is privatized and currently at 98 percent occupancy. Construction would be required to meet shortfalls in HQ buildings, barracks, and other facility types. Construction at SBMR would involve the demolition of existing facilities to provide a footprint for new construction.

NO_x emissions are of concern primarily as an O_3 precursor. Even though construction emissions would increase, annual emissions of O_3 precursors from construction activities associated with construction as a result of all stationing alternatives would be too small to have a measurable effect on O_3 levels. Generation of GHG emissions would increase with additional Soldiers and Family members and additional facilities. The increase in GHG emissions would not be anticipated to increase by more than 3 to 5 percent from current USAG-HI operations.

Impacts to air quality from construction would be temporary, occurring during the 12-24 months of facilities construction. Vehicle emissions and fugitive dust generated by heavy construction equipment and materials transport may have short-term impacts that are anticipated to be less than significant. Construction contractors would comply with rules on fugitive dust. Units would utilize existing or previously planned weapons qualification ranges on which to train; therefore, limited minor impacts are anticipated. This alternative would not involve new training range construction at SBMR or training sites on O'ahu or at PTA. Ranges would continue to be maintained through routine maintenance activities.

***Live-Fire Training*.** Soldiers would conduct additional live-fire and maneuver training as a result of this alternative. Minor impacts from additional live-fire training are anticipated. Soldiers would conduct live-fire training to meet semi-annual live-fire training requirements. Live-fire

activities and munitions expenditure on SBMR and O'ahu training site ranges would increase less than 10 percent in comparison to current live-fire training levels. This would result in minor impacts. At SBMR and South Range, the emissions released into the environment from live-fire training would result from the use of small arms weapons such as M-16 and M-4 rifles; crew served weapons such as machine guns; and explosive munitions. Frequency of wildfires could increase with additional live-fire training and could increase wildfire emissions.

Rifles and machine guns have very low emissions rates; while smokes may lay an obscuration cloud with surface concentrations of 4 to 260 milligrams per square meter, these clouds are generally dispersed quickly (depending on wind speed and direction). Air emissions from firing qualifications are released at the firing point. These emissions are anticipated to be relatively minor and are found at the EPA's Technology Transfer Network Clearinghouse for Inventories & Emissions Factors, AP42, Fifth Edition, Volume I (EPA, 2009). At DMR, smoke, obscurant, and flare use would increase as result of this alternative. Based on the studies conducted by the Army and addressed in Air Pollutant Emission Factors (AP42s) published by the EPA, there would be a very low risk of emissions generated from these training devices. At KTA and SBER, the use of some pyrotechnic devices may be employed, but due to their low annual utilization rate and air emission rates, the use of these devices is not anticipated to have significant effects to air quality. Only blank ammunition, which poses very little risk of creating adverse air quality effects, is used at KLOA. Live fire and other training activities would increase the risk of wildfires in proportion to the percentage increase in training munitions use, and increase the risk of wildfire associated air pollutant emissions (for example polycyclic aromatic hydrocarbons). Based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with increased ordnance use at DMR would contribute only minor air emissions in comparison to current baseline conditions.

***Maneuver Training*.** Additional maneuver training could result in significant but mitigable impacts on O'ahu training sites and at PTA. As a result of the implementation of this alternative, limited maneuver training would occur across the training areas of USAG-HI to include KTA, SBMR, South Range, SBER, KTA, and KLOA. Units would conduct training on the Island of O'ahu and Hawai'i to obtain proficiency in individual unit skills and would support maneuver rotations of combat units at PTA. Unit maneuvers are anticipated to increase by approximately 10 percent on O'ahu maneuver training areas. Air quality impacts from this alternative are significant but mitigable. Vehicle training would occur primarily on roads, trails, maneuver areas, or hardened surfaces and would increase the occurrence of opacity or fugitive dust emissions; however, these effects are anticipated to be localized to the range area. Vehicle emissions would also add to the pollutants currently being released in maneuver areas including PM, CO, SO_x and other reactive organic compounds. The overall increase in these compounds would correlate highly with the number of increased Maneuver Impact Miles (MIM) resultant from implementing stationing alternatives. The amount of off-road vehicle activity would increase due to proposed training activities. Off-road vehicle activity would reduce vegetation cover in affected maneuver training areas of PTA, SBMR, KTA, DMR and South Range Acquisition Area, resulting in increased susceptibility to fugitive dust emissions from vehicle travel and wind erosion. PM_{10} would be generated by these actions at the affected areas. If a need arose to increase in numbers of Soldiers traveling to PTA, it would be subject to further, site-specific NEPA analysis.

Significant impacts are not anticipated from the stationing of additional Soldiers, although adverse impacts to air quality are anticipated from both mobile and stationary emission sources. Additional stationing or mobile source emissions would not result in a violation of air quality standards in Hawai'i or an exceedence of SBMR's Title V permit. Neither would the action

cause surrounding communities to violate such standards. Further analysis would be necessary to quantify these impacts if 1,500 additional Soldiers were to be stationed in Hawai'i. Mitigation includes: revegetation projects involving site preparation, liming, fertilization, seeding or hydroseeding, tree planting, irrigation and mulching. These actions reduce the impact to less than significant.

4.18.3 Airspace

4.18.3.1 Affected Environment

The airspace above the Island of O'ahu is generally controlled airspace. The area around Honolulu International Airport is Class B airspace; while other airports on the island are covered by Class D airspace. Wheeler Army Airfield in central Hawai`i is also covered by Class D airspace with a ceiling of 3,300 feet. Although there are no formal military training routes on O'ahu, the military habitually uses select areas within which to train. Typical training activities include 10 helicopters at any one time, although maximum numbers have reached 36 aircraft. During deployment training C-130 aircraft also utilize airspace in and around O'ahu. The Island of O'ahu also has several areas designated as SUA. Uncontrolled (Class G) airspace exists from the surface to up to either 700 or 1,200 feet above MSL over O'ahu in select locations.

Most of the airspace above the northern half of Hawai'i Island is controlled airspace of various classes. Class G (uncontrolled) airspace extends from the surface to 700 feet, except around Kona and Hilo International Airports and Bradshaw Army Airfield, which are surrounded by Class D airspace. The Restricted Airspace that overlays PTA (R3103) extends from the surface to 30,000 feet. Restricted areas contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Activities within these areas must be confined because of their nature, and limitations imposed upon aircraft operations that are not a part of those activities or both. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. Restricted areas are published in the Federal Register, and constitute 14 CFR Part 73. The northern part of Hawai'i Island has one SUA area, the R-3103 restricted area over PTA in the central part of the island with an effective altitude of 30,000 feet and intermittent time of use.

Honolulu Combined Center Radar Approach Control controls this airspace. Projected annual use of PTA's airspace is based on the estimated number of sorties that would be conducted by the different participating aircraft types for U.S. Army and U.S. Marine Corps exercises and transient activities. These projections are based on analysis of the flight training requirements by service, respective subordinate units, and by aircraft type over a typical 12-month period.

Commercial traffic utilizes the low altitude en route airways as do general aviation aircraft on Hawai'i Island. This includes all civil aviation operations, other than scheduled air services and unscheduled air transport operations for payment or hire. More than 50 percent of Kona International Airport's 281 average daily operations; 28 percent of Hilo International Airport's 316 average daily operations; and 78 percent of 'Upolu Airport's 27 average daily operations involved general aviation.

UAS flights primarily are conducted within previously designated restricted areas (e.g., R-3109 and R-3103). For UAS flights that could not be conducted entirely within restricted areas, operations occur in accordance with well-defined FAA procedures for remotely operated aircraft. These procedures include approval of the UAS flights by the FAA regional office in Honolulu at least 60 days in advance. Although CFAs pose no problems to flights, activities within a CFA

must be suspended immediately when radar, spotter aircraft, or ground lookouts detect an approaching aircraft.

4.18.3.2 Environmental Consequences

No Action Alternative

The impacts associated with aviation training, live-fire training and maneuver training with UAS and other aircraft would continue to be minor and would not conflict with civilian aviation or have new impacts on airspace. No change to existing maneuver training on O'ahu ranges would occur. With respect to airspace resources, the No Action Alternative would include flights by UAS associated with units presently stationed on O'ahu. Continued maneuver training of ground-based units (i.e., those without UAS) would have no effect on airspace at SBMR or O'ahu training sites. Helicopter flights between O'ahu training sites and PTA would continue. The use of CFA would continue when USAG-HI units are engaged in live-fire training. A CFA is pre-established above existing ranges. Overall, impacts to airspace would remain minor.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Impacts would be beneficial as a result of the implementation of Alternative 1. The use of airspace would not change significantly with the loss of ground units as a result of this alternative. Aviation and UAS would continue to require airspace to support training. The implementation of Alternative 1 would result in a slight and marginally lower utilization rate of existing military airspace as some units with UAS could be inactivated and no longer require activation and use of the airspace. No additional range expansion projects would occur as a result of this alternative. The use of CFAs would be anticipated to decline in proportion to the reduction in live-fire training events. Reduction in training would likely result in less utilization of general use airspace by the Army. Thus, adverse impacts of closures of SUA would be reduced. This could be considered a beneficial impact to members of the general aviation community. Maneuver training would occur at reduced levels, potentially resulting in less closures of SUA over military lands.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be an anticipated minor impact with the increased use of airspace as a result of this alternative on both O'ahu and Hawai'i. Additional airspace would not be required, however, and scheduling, activation, and utilization of existing military airspace and general use airspace would proceed as it currently does without change. Maneuver training of additional ground-based units would have only minor effects to airspace at O'ahu training sites or on airspace usage at PTA. Although more CFAs would be activated, the Army ceases all live-fire activity when an aircraft is observed. Some additional UAS training (increase by up to 10 percent) may occur as a result of this alternative, but would not require any adjustments to current airspace use designations. Additional airspace is not required to accommodate the types of ground-based maneuvers associated with the proposed growth. Overall impacts from this alternative to airspace would be minor.

4.18.4 Cultural Resources

4.18.4.1 Affected Environment

Cultural resources are defined as historic resources, cultural items, archaeological resources, sacred sites, and collections (documents and artifacts). Cultural resources include prehistoric and historic archaeological sites, historic buildings and structures, and Native American or Native Hawaiian traditional resources. Native Hawaiian traditional resources are discussed as

areas of traditional interest, these categories include traditional resources, use areas, and sacred sites that are potentially eligible for the NRHP as TCPs. These resources are subject to protection under the NHPA, Archeological and Historic Preservation Act, NAGPRA, E.O. 13007 (Indian Sacred Sites), the ARPA, the guidelines on Curation of Federally Owned and Administered Collections (36 CFR Part 79), and other federal and state regulations and treaties. ARs implement Army compliance with the NHPA, NAGPRA, the AIRFA, the ARPA, the Archeological and Historic Preservation Act, E.O. 13007: Indian Sacred Sites; and other federal and state regulations and treaties.

The Cultural Resources Program at USAG-HI oversees the management of over 1,000 archaeological sites and 795 buildings on over 22 sub-installations on O'ahu and Hawai'i, including two NHL and two National Register Districts. The program also supports the requirements of the actions in compliance with programmatic agreements for the Privatization of Family Housing, the Transformation of the 2nd Brigade to a SBCT; and survey, and Routine Training Activities at MMR, Section 106 consultation and monitoring support for natural resources Biological Opinions and Implementation Plans.

Cultural resources on O'ahu include buildings, structures, sites, districts, landmarks, properties of traditional religious and cultural importance, sacred sites or objects from prehistoric or historic occupation or activities. Schofield Barracks contains a National Register District and almost the entire cantonment footprint of Wheeler Army Airfield is a NHL. Fort Shafter also contains a NHL, Palm Circle.

There are five cultural landscape types of significance to Native Hawaiian tradition and culture. These are 1) Areas of naturally occurring or cultivated resources used for food, shelter, or medicine; 2) Areas that contain resources used for expression or perpetuation of Hawaiian culture, religion, or language; 3) Places where historical and contemporary religious beliefs or customs are practiced; 4) Areas where natural or cultivated endangered terrestrial or marine flora and fauna used in native Hawaiian ceremonies are located, or where materials for ceremonial arts and crafts are found; and 5) Areas that provide natural and cultural community resources for the perpetuation of language and culture including place names and natural, cultural, and community resources for art, crafts, music, and dance.

Archaeological sites on O'ahu training sites are diverse and may include heiau (religious structures), koa (small shrines), fishponds, stone markers, fishing shrines, habitation sites, caves and rock shelters, mounds, burial platforms, earth ovens, stone walls and enclosures, agricultural terraces, canals or ditches, rock art sites, and trails. Historic period archaeological sites include gun emplacements, concrete structures and bunkers, concrete walls, wooden structural remains, masonry platforms, concrete revetments, bermed depressions, berms and rock piles, tunnels, miscellaneous feature complexes, road beds, railroad remnants, and midden deposits.

The central plateau where SBMR is located is of religious and cultural significance to Native Hawaiians, and numerous traditional natural settings exist in the area. Hawaiians lived in the central plateau of O'ahu hundreds of years before European contact. The boundaries of SBMR correspond roughly to the traditional Hawaiian land unit called Waianae Uka, a land-locked portion of the ahupuaa of Waianae. Waianae Uka was somewhat isolated from the rest of its ahupuaa, and the trail that connected Waianae Uka with Waianae Kai (coastal portion) by way of Kolekole Pass was strategically important. Archaeological evidence indicates the presence of traditional Hawaiian agricultural field systems, both dryland and irrigated taro wetland fields (lo'i) along the streams that flow through SBMR.

Archaeological surveys have been completed in the SBMR cantonment area, south, east and west ranges and Wheeler Army Airfield. Investigations have documented more than 250

archaeological sites. All identified cultural resources are treated as eligible to the NRHP until formal determinations of eligibility are made for the NRHP.

If construction is required, the Army would take every precaution to identify and avoid impacts to cultural resources. USAG-HI conducts additional cultural resource surveys on lands that may be affected by future construction, prior to earth disturbing activities.

Traditionally, important places in the area of DMR are associated with spiritual beings, myths, legendary stories, and oral histories along the shoreline, on the upper slopes of the mountains above the installation, and in Kaena to the west. Archaeological evidence of prehistoric land use and settlement on DMR is extensive. Native Hawaiians buried their dead in a line of sand dunes along the coast fronting DMR. Along the slope at the foot of the Waianae Mountains are several agricultural features indicating crop cultivation in the area. Part of the slope area was set aside as a sacred place on which Kawailoa Heiau was constructed (USAG-HI, 2004). The entirety of DMR has been surveyed for archaeological sites. Twenty-four sites have been identified. Nine of the sites contain prehistoric or traditional components and one of these sites is very extensive. The remainder are historic sites related to agriculture, transportation, and military use (USAG-HI, 2004). Surveys covering the historic built environment at DMR occurred in the 1990s. These surveys identified 21 buildings associated with a Nike missile site. All but five of these have been demolished. No TCP surveys or oral histories have been completed for the DMR. NRHP eligibility determinations for the DMR sites are currently underway.

KTA is on the northernmost point of the traditional Koolauloa District. Legends hold that this land was once a separate island. Many traditional stories are associated with this land (USAG-HI, 2004). The KTA area has been occupied at least seasonally since the 14th century; evidence of early occupation includes rockshelters, burials, irrigation complexes, and habitation sites. In the late 17th century, there was a more intensive settlement of the upper valleys (USAG-HI, 2004). Past surveys conducted by the Army have located 172 archaeological sites on KTA and 79 sites on KLOA. One of the sites at KTA is a heiau that is listed on the NRHP. The other KTA sites are currently being evaluated for eligibility to NRHP. A variety of Cold War era buildings and structures exist on KTA. The buildings and structures are principally part of the NRHP-eligible Nike missile complex that was in use between 1961 and 1970, but is no longer accessible or used. The NIKE Site, no longer in active use, is being maintained until another use can be determined for it. As noted earlier, all identified cultural resources are being treated as eligible for the NRHP and appropriately protected until formal determinations are made.

At PTA, over 40 archaeological investigations have been conducted, with most of the studies occurring during the mid-1980s and 1990s. Many previous studies covered large areas by helicopter survey, which only identifies very large sites. Site types identified at PTA include transportation features (trails and trail markers); occupation sites (lava tubes, blister caves, and overhang shelters); lithic resource sites (e.g., chill glass quarries and workshops); ritual/ceremonial sites (indicated by upright stones); excavated-pit features; historic features (walls, enclosures); and military modifications/impacts More than 500 archaeological sites have been identified at PTA and surveys are on-going. Additional surveys are being conducted as part of the ongoing EIS for PTA range development.

PTA is part of a larger cultural landscape that includes the sacred mountains Mauna Kea and Mauna Loa and the Saddle area between them. The area is spiritually and historically one of the most important places in Hawaiian tradition and history. The importance of Mauna Kea, Mauna Loa, and the surrounding landscape can be seen in the abundance of physical or archaeological remains and through the many oral histories that describe historical events and uses of the area (Maly 1999; Maly & Maly 2002, 2004, 2005). The region around PTA contained a rich resource

zone that supported traditional activities that included bird hunting for feathers and meat, quarrying volcanic glass, and lithic workshop locations for manufacturing the adzes made from Mauna Kea basalt. The Saddle region has numerous trails and served as a much-used passage for travelers moving both cross-island and to the Mauna Kea and Mauna Loa summits. Cave shelters are abundant due to the extensive natural lava tube systems in the area. These cave shelters provided refuge from the elements and, because there is relatively low rainfall within the region, served as a source of limited water. Archaeologists speculate that ancient Hawaiians practiced various economic activities in this uplands area. Radiocarbon dating of PTA sites (primarily caves) indicates occupation between the 12th and 18th centuries.

4.18.4.2 Environmental Consequences

No Action Alternative

There would be no additional impacts to cultural resources under the No Action Alternative. Impacts would remain significant but mitigable.

Despite ongoing surveys and the implementation of protective measures and post-training monitoring of known sites by cultural resource personnel, there remains a potential for impacts to undocumented sites. The use of live-fire ranges, even at existing levels, would remain a potential cause of impacts to cultural resources. Mechanisms and procedures are in place to monitor the effects of operations, maintenance, and training exercises, and to respond to any unanticipated discoveries. The Army would continue to inventory and evaluate cultural resources in compliance with Section 110 of the NHPA, and project planning would comply with Section 106 and its implementing regulations.

Significant but mitigable impacts to cultural resources could occur. There would always be some chance of inadvertently discovering cultural resources; however, advance coordination with the USAG-HI Cultural Resources program would and does minimize potential impacts. USAG-HI would continue to manage its lands to minimize risk to inadvertent loss of cultural resources, respect the cultural practices and traditions of the Hawaiian people, and afford protections to the cultural integrity of the Hawaiian landscape.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Significant but mitigable impacts are anticipated with this alternative at USAG-HI. Building demolition, solid waste disposal, site recapitalization, and repurposing of existing facilities to assist the Army in efficiently managing its infrastructure and operating costs, while supporting its Soldiers could potentially disturb or damage archaeological resources, or could alter properties and districts. Any demolition or repurposing activity occurring in or adjacent to the Historic District and/or NHL would require Section 106 consultation. USAG-HI would avoid potential impacts to known archaeological resources during planning for potential cantonment area modification. If impact could not be avoided, measures to minimize or mitigate adverse impacts to archaeological resources would be developed through the NHPA Section 106 consultation process. All activity associated with this alternative would occur on previously disturbed ground. Thus, adverse impacts to archaeological resources are unlikely.

Alternative 1 could result in the modernization and re-purposing of outdated range infrastructure to accommodate new training requirements on facilities that are no longer needed by Army units as a result of force reduction. Construction activity would involve grading and re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface during range repurposing activities. Although these repurposing projects would be located on previously disturbed ground, construction activities have the potential to result in damage to yet-to-be discovered cultural resources. USAG-HI would attempt to avoid potential impacts to cultural resources during facility planning. If impacts could not be avoided, measures to

minimize or mitigate adverse impacts to cultural resources would be developed through the NHPA Section 106 consultation process. There are no specific range projects identified in this category, and any such projects would be the subject of further NEPA analysis.

The frequency and intensity of maneuver training would decrease as a result of this alternative. All remaining maneuver training would be conducted within the footprint of existing ranges and trails at USAG-HI; however, any impacts resulting from maneuver training to undocumented cultural resources would be reduced given the lower amount of Army training occurring as a result of this alternative. While this component of the alternative would result in a long-term reduction of risk to cultural resources and a beneficial impact, overall impacts as a result of implementation of the alternative would remain significant but mitigable.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

This level of growth on USAG-HI is anticipated to have a significant but mitigable impact to cultural resources. Measures are being developed or are in place to accommodate training while preventing adverse impacts to cultural resources. The types of training conducted by the additional Soldiers would not change, though some training areas on USAG-HI might be used with marginally more frequency or intensity compared with current baseline conditions.

Garrison construction supporting the growth stationing scenario could disturb or damage archaeological resources, or could alter landmarks and districts. Infill construction in the main post and any associated demolition of facilities to make room for new construction within USAG-HI's current cantonment areas, primarily at SBMR, Wheeler Army Airfield and Fort Shafter, may result in an adverse effect. USAG-HI would attempt to avoid adverse effects to cultural resources during planning for potential cantonment construction. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be developed through the NHPA Section 106 consultation process.

All cantonment construction associated with Alternative 2 would likely occur on previously disturbed ground. The Army would attempt to avoid adverse impacts to the Wheeler NHL buildings and structures, the Fort Shafter NHL at Palm Circle, and the Schofield Barracks Historic District. Siting new facilities in new locations of cantonment areas may require additional surveys for archaeological resources. The garrison would avoid building on known sites and would conduct Section 106 consultation with the SHPO, the Office of Hawaiian Affairs, and appropriate Native Hawaiian organizations/individuals as required.

Construction of additional training range areas, if required, would involve grading and re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface during new range infrastructure construction. Expansion of some ranges may be required, though the construction of new additional ranges is not projected to be a requirement to support this alternative. Although range expansion projects would ideally be located on previously disturbed ground, construction activities have the potential to result in damage to yet-to-be discovered cultural resources. USAG-HI would avoid potential impacts to cultural resources during planning for potential range infrastructure construction. If impacts could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process.

Live-Fire Training. Negligible impacts from live-fire training are anticipated. Any range expansion and new targetry would be sited to avoid cultural resources. The Army would conduct the appropriate level of site-specific NEPA analysis in conjunction with any future range proposals. No specific range expansion projects are currently known to be required for implementation of Alternative 2 at this time.

Combat Support Units. Stationing scenarios involving Combat Support units, particularly engineer or combat engineer units, may involve some surface excavation, which could potentially uncover or damage undocumented cultural resources. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process.

Maneuver Training. Potential impacts from maneuver training would be the most widespread impacts associated with the implementation of Alternative 2 across training areas in USAG-HI. Maneuver training activities would be anticipated to increase by approximately 10-15 percent. Additional combat units, combat support units, and combat engineers would engage in surface excavation activities and demolitions at select areas on O'ahu (SBMR, KTA, DMR and KLOA) and at PTA. These activities would occur within areas that have been surveyed and designated as appropriate for this type of activity. New units would primarily maneuver on existing roads and trails and are not projected to do much off-road or trail maneuver or surface excavation. Maneuver activities for these scenarios have been assessed as less than significant impacts. Maneuvers would be restricted around known archaeological sites.

Overall, significant but mitigable impacts to cultural resources would be anticipated to occur with the implementation of Alternative 2. There would always be a minor risk of inadvertently discovering unknown cultural resources; however, advance coordination with the USAG-HI Cultural Resources program would and does minimize potential impacts. USAG-HI would continue to manage its lands to minimize risk to inadvertent loss of cultural resources, respect the cultural practices and traditions of the Hawaiian people, and afford protections to the cultural integrity of the Hawaiian landscape.

The primary mitigation is the avoidance of sites so impacts would be minimized. Areas around known sites are designated as no-use areas for maneuver training and protective measures would be placed around sites to avoid impacts from training. There would be regular monitoring of known sites by cultural resource personnel after training activities to ensure that the site protection measures are working and to adjust protection, if needed. If sites cannot be avoided, appropriate mitigation measures that may include data recovery would be implemented after appropriate consultation.

The Army has been working to mitigate adverse effects to cultural resources by redesigning projects to avoid cultural resources, developing and implementing cultural resource site protection plans for construction and UXO clearance, monitoring earth disturbing activities when appropriate, and developing long-term site protection measures. The Army would engage in Section 106 consultations regarding various aspects of the proposed projects, to include appropriate mitigation measures as siting/design plans continue to develop.

4.18.5 Noise

4.18.5.1 Affected Environment

The principal sources of noise at Schofield Barracks, O'ahu training ranges, and PTA include vehicle traffic, small and large caliber weapons and artillery firing, and helicopter flights which are heard at locations outside the installation boundary (PHC, 2010). Noise from firing of large caliber weapons firing affects most of Schofield Barracks; and individual detonations are audible in residential areas near the boundaries of the installation.

At SBMR, the majority of the small arms firing training noise contours remain within the SBMR boundary with only the NZ II noise contour extending off post into areas of agricultural and preservation land uses (PHC, 2010). The Army's noise computer modeling program for small arms noise, cannot take into account reflection or absorption of terrain, so the actual levels

existing beyond the installation boundary may well be less than 87 dB peak sound pressure level (PK15(met)) due to the mountainous terrain surrounding the majority of the installation. The NZ III noise contours are contained within the installation boundaries; however, a portion the RCI Housing is contained within NZ II. There are no non-recommended land uses off post within the NZ II noise contour, but there are non-recommended land uses on post within the NZ II noise contours in the RCI housing area.

SBMR is also impacted by low frequency noise from large caliber weapons firing and artillery. The majority of the NZ III noise contours are contained on post except for an area approximately 360 meters off post to the north in an agriculturally zoned area (PHC, 2010). The NZ II and LUPZ noise contours extend off post to the north and south, but are contained entirely within agricultural and restricted preservation zoned areas. There are no incompatible land uses off post within the NZ II or NZ III noise contours. On post, the NZ II and LUPZ noise contours overlap the RCI housing area located east of installation artillery firing points. There are non-recommended land uses on post (RCI Housing) within the NZ II. The moderate risk of complaints (115-130 PK15(met)) noise contour from existing operations training at SBMR overlaps in the Town of Wahiawa. On post, the high risk of complaints (greater than 130 dBA) noise contours overlaps the RCI housing area (PHC, 2010).

At SBMR, NZ II conditions encompass much of the cantonment area and extend into undeveloped areas to the north and south of the cantonment area; the exposure area for NZ II does include Solomon Elementary School and Hale Kula Elementary School (with the nighttime penalty factor). NZ II contours also extend approximately 985 to 1,300 feet to encompass additional Soldier and Family housing areas on the eastern part of the main post. Some undeveloped areas to the north and south of the post may also be affected (USACE, 2008a).

Aircraft activity at Wheeler Army Airfield also generates substantial noise energy. The NZ III noise contours are contained on Wheeler Army Airfield property except for a very small region that overlaps the SBER and is compatible with the noise environment. There are no incompatible land uses on or off post within the NZ III noise contours (PHC, 2010). A 65-dBA L_{dn} contour around Wheeler Army Airfield extends into Leilehua Golf Course but not into any residential area. Aircraft flight noise at Wheeler Army Airfield also affects residential areas on and off post.

No live-fire training is conducted at SBER, only simulated training, pyrotechnic devices, and blank ammunition; East Range contains no impact areas or firing ranges.

At DMR, KTA, and KLOA the dominant noise sources include general aviation aircraft, vehicle traffic, limited military aircraft traffic, military vehicle traffic, and limited use of blank ammunition during Army exercises. Blank ammunition is primarily used at KLOA. Ordnance use at KTA consists primarily of blank ammunition and pyrotechnic devices (*FEIS for the Permanent Stationing of the 2/25th SBCT* (USAEC, 2008a)). Some noise effects from ordnance use at KTA may be experienced at nearby residential areas. At DMR, KTA and KLOA there are no activities generating NZ III level impacts that affect sensitive noise receptors; however, there have been occasional noise complaints from some training events that occur at DMR.

PTA is used for year-round LFX by all branches of the U.S. Military. The principal sources of noise on PTA are generated through small arms and large caliber weapons firing (PHC, 2010). Small arms training at PTA does not generate any NZ III noise contours that leave the installation boundary, nor do any NZ III impacts overlap any noise sensitive areas on post. The NZ II noise contour extends off post in a small area of forest reserve land and is acceptable and compatible for the noise environment. There are no incompatible land uses on or off post within the NZ II noise contour (PHC, 2010). Large caliber live-fire training NZ III contours are mostly contained within the installation boundary. The majority of the NZ III noise contours are

contained on post at PTA except for several small areas north extending approximately 150-200 meters in forest reserve land (PHC, 2010). The NZ II and LUPZ noise contours exist off post, but are contained entirely within forest reserve land. There are no incompatible land uses on or off post within the NZ II and NZ III noise contours. The risk of complaints off post would be extremely low or non-existent in the forest reserve area. The risk of complaints on post would be moderate in the PTA building and office area.

4.18.5.2 Environmental Consequences

No Action Alternative

As under No Action Alternative, the current levels of noise created by Army activities would not change from the conditions described in Section 4.18.5.1. Noise from live-fire and maneuver training, and aviation overflights would continue to be produced at existing levels, and are anticipated to remain significant but mitigable. Procedures to minimize aviation noise impacts and training noise impacts would continue to be implemented.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Impacts from noise are anticipated to be beneficial as a result of the implementation of Alternative 1. Existing ranges would still be utilized for firing the same types of weapons systems and conducting the same types of training. USAG-HI would experience an anticipated reduction in the frequency of noise generating training events, both from small arms firing and large caliber weapons and artillery firing as a result of this alternative. Noise contours and impacts would diminish. The number of weapons qualifications and maneuver training events could be anticipated to decrease by up to 30 percent. Noise impacts would likely remain comparable to current conditions, though less frequent leading to a reduced risk of noise complaints. The current frequency of aviation training activities, a contributor of noise at the installation, would not be anticipated to change more than marginally, as aviation units would not be impacted by these decisions.

Impacts from building demolition, site recapitalization, and the repurposing of existing facilities to accommodate different Army needs would be temporary. A decreased frequency of noise-generating events would correspond to the decreased maneuvers resulting from a reduction stationing scenario to include noise effects that would be produced from convoy travel on public roads.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be a continued significant-but-mitigable impact on the installation and surrounding communities by the restationing of up to 1,500 Combat/Combat Support Soldiers. Stationing would not involve new aviation units and would therefore not contribute to noise impacts in and around Wheeler Army Airfield. Given that there are no new types of activities that would occur as a result of stationing these Soldiers, just an increase in the types of existing noise generating activities (an increase by 10-15 percent), no major changes are anticipated from baseline conditions of the affected environment.

Impacts from garrison construction would be temporary. Noise associated with construction would result mainly from the movement of vehicles and equipment. Noise associated with construction equipment generally produce noise levels of 80 to 90 dBA at a distance of 50 feet. Permissible noise exposures identified by the OSHA (29 CFR 1910.95) for an 8-hour work day is 90 dBA; therefore, construction noise in the cantonment area would likely be compliant with these levels. The zone of relatively high construction noise may extend to distances of 400 to 800 feet from major equipment operations; and those locations that are more than 1,000 feet

from construction sites generally do not experience significant noise levels; however, temporary noise impacts may occur to wildlife. These effects are discussed in Section 4.18.7.

Although there would be an increase in Soldiers maneuvering, the type of noise would be consistent with ongoing maneuver activities. The increased frequency of noise generating events would correspond to the increased maneuvers associated with these stationing scenarios (10 to 15 percent) at KLOA, SBER, DMR, and KTA. The noise effects that would be produced from convoy travel on public roads (when traveling between installations and maneuver sites) would be short term as these activities are intermittent and are usually mitigated through SOPs for convoy maneuver.

At SBMR, the Army anticipates a slight expansion of NZ II contours and some small changes in the location of NZ III contours within the SBMR ROI with the implementation of Alternative 2. NZs would impact additional Soldier and Family housing areas on the eastern side of the main post. NZ II would expand into some undeveloped areas north and south of SBMR, but are not anticipated to expand into existing off-post residential areas. Solomon Elementary School and Hale Kula Elementary School would remain within the NZ II noise contour. Some additional Family housing units would be encompassed by the NZ III contour in this area. The increase in noise levels would combine with existing noise that already represents a significant but mitigable impact.

Maneuver Training. Noise levels along on-post roadways and along military vehicle trails would increase; however, overall traffic volumes and vehicle speeds generally are low for these types of roadways. As a result, noise increments attributable to vehicle traffic would remain within the Army's land use compatibility guidelines. Traffic on military vehicle trails between SBMR and other installations would increase noise levels along the trail corridors during the periods of vehicle travel. Because there are no noise-sensitive land uses immediately adjacent to Helemano Trail, these noise levels would constitute a less than significant impact. Military vehicle maneuvers would occur along unpaved roads and in various off-road areas at SBMR and SBER. Peak pass-by noise levels would drop by 15 dBA at a distance of 500 feet from the travel path. Vehicle maneuvers would occur during both daytime and nighttime hours, making vehicle maneuver activity noise an issue of concern where residential land uses and school sites are close to SBER boundaries. Because vehicle speeds are low during most maneuver activities and vehicles tend to be relatively dispersed during off-road maneuvers, maneuver activities would be anticipated to produce hourly average noise levels of less than 55 dBA at a distance of about 500 feet, with brief peaks of 65 to 70 dBA. Such noise levels would not cause significant noise effects at off-post noise-sensitive land uses during daytime hours. These noise levels would be more disturbing during nighttime hours. The Army has established a 1,000-foot noise buffer along those portions of SBER that border residential areas of Wahiawa. As long as nighttime vehicle maneuver activity is minimized in this buffer area, vehicle noise from training and maneuver activities would be less than significant.

Vehicle maneuver training would occur at DMR. During an individual training activity at DMR, fewer than 75 vehicles are operating at any one time. Vehicle activity within DMR would produce comparably low noise levels. Consequently, noise from military vehicle use at DMR would constitute a less than significant impact. Most military vehicle travel to and from KTA and KLOA would occur on the Helemano Trail and Drum Road. In addition, vehicle maneuver activity would occur at KTA. During an individual training activity at KTA and KLOA, up to 241 vehicles are anticipated to be operating at any one time, with up to 216 vehicles using Helemano Trail and Drum Road to reach KTA. For the maximum number of vehicles, resulting hourly average traffic noise levels along Helemano Trail and Drum Road would be about 72 dBA at a distance of 50 feet from the vehicle trail and about 64 dBA at 200 feet from the vehicle

trail. Vehicle activity within KTA and KLOA would produce comparably low noise levels, so noise from military vehicle use at KTA and KLOA would constitute a less than significant impact.

Regulatory and Administrative Measure 1. Due to the proximity to housing units, the installation generally avoids using ranges beyond 2000 hours (8:00 p.m.). This stationing scenario may result in an increased need at SBMR to extend some range firing times beyond 2000 hours, which may have potential effects to nearby residents. As hours of live-fire operations may extend, an increased level of nighttime noise may be audible at Solomon Elementary School and Hale Kula Elementary School; however, because regular educational hours are during the daytime, and because the majority of elementary school extracurricular activities (including plays, recitals, or meetings) are likely to occur prior to 8:00 p.m., these impacts are not anticipated to affect school-related activities.

Regulatory and Administrative Measure 2. The noise effects that would be produced from convoy travel on public roads (when traveling between maneuver areas and their home station) would be short term, as these activities are intermittent and are usually mitigated through SOPs for convoy maneuver. A convoy is normally defined as six or more military vehicles moving simultaneously from one point to another under a single commander, 10 or more vehicles per hour going to the same destination over the same route, or any 1 vehicle requiring a special haul permit. Per command guidance, USAG-HI convoys normally maintain a gap of 15 to 30 minutes between serials (a group of military vehicles moving together), 330 feet between vehicles on highways, and 7.5 to 15 feet while in town traffic. Per state regulation, military convoys are not authorized movement on state highways during peak-hour conditions (between 6:00 a.m. and 8:30 a.m. and 3:00 p.m. and 6:00 p.m., Monday through Friday). Movements on Saturday, Sunday, and holidays would be by special request only. The garrison would continue to implement policies on convoy travel that would mitigate adverse effects from vehicle noise.

Regulatory and Administrative Measure 3. To abate aircraft noise, pilots are trained to avoid unnecessary over flight of populated areas as well as single houses. In order to gain public acceptance, all pilots are trained to be sensitive to the concerns of the surrounding communities. The 25th Infantry Division Aviation Officer has designated noise sensitive areas and procedures in the "Noise Abatement and Fly Neighborly" policy for Wheeler Army Airfield units. Procedures include:

- Operations at Wheeler Army Airfield from 2300L to 0600L daily are restricted to departures, arrivals, and refueling operations (no closed traffic).
- The only authorized landing areas on Schofield Barracks are Pad 4 and Dragon X. Landing at any other area requires coordination with the Assistant Division Aviation Officer and a safety survey by the supporting unit.
- Terrain flight training would be conducted only on the Schofield, Makua, Dillingham or Pohakuloa Military Reservations, or in a Tactical Flight Training Area.
- Overflight of designated noise sensitive areas below 3,000 feet MSL (O`ahu) or 2,000 feet AGL (Big Island) is prohibited except in specific cases outlined in the policy.
- Wheeler Army Airfield Base Operations would maintain a master map of all designated noise sensitive areas for the Island of O`ahu. Wheeler Army Airfield Base Operations would maintain a FY sequential log of changes to facilitate posting. Units would:
    - Post a copy of the map in their respective flight planning areas for pilot use. Wheeler Army Airfield Base Operations would alert units to additions and changes to the master map via Notices to Airmen.
    - Update their flight planning maps as Notices to Airmen are published.

  - Verify the updates from the master map quarterly (October, January, April, July) and would post the date updated on their unit map.
- When operating in areas other than the Tactical Flight Training Area, military reservations or designated noise sensitive areas, pilots would maintain a minimum of 1,000 feet AGL, with the following exceptions:
  - When complying with these altitudes would violate basic visual-flight-rules weather minimums. Pilots are urged to use alternate routes if weather would not permit flight at the published route altitude.
  - When conducting flights in support of civilian law enforcement or public safety agencies.
  - When on a Night Vision Goggle formation flight conducted over unpopulated areas (examples: Molokai and the Big Island). The route(s) must be reconned during daylight at the altitude to be flown Night Vision Goggle. The route(s) must a have a minimum of 2,000 feet lateral clearance from any populated or posted noise sensitive areas and a minimum of 1,000 feet lateral clearance from any single dwelling. Minimum Night Vision Goggle mission altitude would be 500 feet AGL. Approval authority for these Night Vision Goggle formation flights would be no lower than Battalion/Squadron Commander.
  - Overwater tactical flights may be conducted at less than 1,000-foot ASL when flown further than 0.25 nautical mile from the shoreline.
- Aircraft transitioning along shorelines would remain a minimum of 0.25 nautical mile off shore or 1,000 feet above the highest obstacle within 2,000 feet laterally, unless complying with conditions listed above.
- Intentional flight within 1,000 feet, vertically or laterally, of a whale or whale pod is prohibited by federal law. If flying below 1,000 feet above the surface and these animals are observed, alter flight path so as to avoid them by 1,000 feet.
- Pilots are reminded to avoid overflight of National Parks and Wildlife Refuges below 2,000 feet AGL.
- No over flight of livestock.
- Aircraft conducting external load missions would avoid overflight of built-up/populated areas.
- Intentional flight within 1,000 feet, vertically or laterally, of any surface vessel is prohibited.

4.18.6 Soils and Geology

4.18.6.1 Affected Environment

The topography of USAG-HI ranges from nearly flat to sloping, to steeply sloping terrain, dissected by mountain ranges. Soils generally consist of volcanic ash and silty clays, and are high in magnesium, calcium, and iron. The soils are moderately permeable with slow surface water runoff (U.S. Army, 1995). A brief description of soil characteristics and erodibility for the ROI is included in the paragraphs that follow.

The USAG-HI ITAM program is responsible for inventorying and monitoring land conditions, educating land users to minimize potential adverse impacts from use, integrating training requirements with land capacity, and implementing land maintenance and rehabilitation projects. The garrison manages the soils primarily by managing natural water run-off rates,

erosion, and sedimentation in streams and other waterbodies to ensure the continued and sustainable use of resources.

The main post of SBMR is geographically located within the Waianae Range geomorphic province with the Kaukonahua stream to the east, and the Town of Wahiawa to the west. The elevation ranges from 660 feet above MSL to approximately 3,000 feet above MSL. The soils are similar to much of the rest of the Hawaiian Islands, thin, acidic, and derived from volcanic ash and high in organic matter. Soil erodibility is moderate to high.

Much of the South Range area is south of Waikele stream, and is comprised of east-sloping upland sloping from an approximate elevation of 1,200 feet above MSL in the southwest to roughly 850 feet above MSL near Wheeler Army Airfield in the east. The upland area is divided by Waikele Gulch and several north-draining tributaries to Waikele stream. The soils there are underlain by Kunia silty clay; however, soils on the east side of the area include Kolekole silty clay loam and Mahana silty clay loam. Water runoff is low and presents a slight erosion hazard. It is important to note that the State of Hawai'i classifies South Range as being "important farmland" because it supports un-irrigated pineapple culture.

Wheeler Army Airfield is located between the SBMP and SBER facilities, at the southern portion of the Schofield Plateau. Wheeler Army Airfield is mainly flat with gentle slops and has an elevation range of 860 feet above MSL to 790 feet above MSL. The soils there are well drained and are at least 4 feet thick, developed on alluvium over weathered basalt. Water runoff is slow. The erodibility of soils is minimal, except for the area nearby Waikele stream, which has a high erosion hazard.

The SBER facility is bound between the Kauhonahua watershed and the Waikele watershed in the south. The northern boundary lies between the Kaukonahua watershed and Poamoho watershed. The elevation ranges from 2,681 feet above MSL to approximately 850 feet above MSL. The area is comprised of rugged terrain and steep stream valley walls. The East Range contains thin soils and is considered rough mountainous land. Soils are underlain by saprolite. The ridge tops are poorly drained, consisting of silty clays and high in organic matter retaining a high compaction potential and moderate erosion potential. Soils found downslope of these areas are generally composed of silty clay. On the gentler slopes of the facility, soils can be gravelly with a slight to moderate erosion potential.

The elevations of KTA and KLOA range from approximately 1,860 feet above MSL to at or near sea level. The soils primarily consist of silty clay, which is well drained and runs deep in the subsurface. Sloping areas are comprised of moderately fine to fine subsoil which raises the erodibility of the soils on steep slopes to high. The Paumalu-Badland Complex soils exhibit medium to rapid runoff and have a medium erosion potential. The Badland area contains rocky land with a high erosion potential due to existing erosion caused by wind and water. The KTA area has experienced a high soil loss due to training operations.

DMR is on O'ahu's Waialua Plain and extends to the Waianae Range. Elevation ranges from near sea level on the northern boundary to 200 feet near the southern boundary. Soils at DMR are developed on beach sand deposits, with various mixtures of finer and coarser sediments. Most of the area is underlain by Jaucas sand, which has been disturbed or filled to construct the airstrip, roads, and building sites. DMR also contains boggy seasonal wetlands, which are underlain by Lualualei clay, and marginal sloping uplands predominantly underlain by Kaena very stony clay or other stony or rocky soils. The Jaucas sand is highly susceptible to wind erosion. Kaena very stony clay exhibits moderate to severe water erosion (USAG-HI, 2004).

PTA's high elevation, coupled with the area's relatively young geologic age, low precipitation, and rapid runoff, results in mostly thin and poorly developed soils. Much of the land surface of

PTA is characterized by sparsely vegetated basaltic rock in the early stages of decomposition and soil formation. Pāhoehoe lava, ʻaʻā lava, and miscellaneous land types (e.g., puʻus) cover approximately 80 percent of the installation. Of the 132,819 acres at PTA, only about 10,000 acres are classified as soils formed on volcanic deposits, most of which lies within the Keamuku parcel (KMA). Twenty-four soil types were identified and broadly classified at PTA, with 14 soil types within the KMA. Deeper soils are found in the northern and western portion of the installation (i.e., KMA). Most of the central and southern portions of PTA are covered by lava flows, and small amounts of eolian sands.

4.18.6.2 Environmental Consequences

No Action Alternative

The Army activities contributing to soil erosion would not change from the conditions described in Section 4.18.6.1, under the No Action Alternative. Construction of cantonment and range projects would proceed as they are planned, and would temporarily create conditions promoting soil loss. Live-fire and maneuver training would continue to disturb soil and remove vegetation creating the potential for soil erosion. Impacts on both O'ahu and at PTA would continue to be significant but mitigable. Standard range maintenance BMPs implemented by USAG-HI include road grading, target repair, and berm recontouring. Mitigation measures, implementation of the ITAM annual work plan, and BMPs are followed to minimize soil loss and mitigate impacts to a less than significant level. Mounted and dismounted maneuver training of existing vehicles would continue. Maneuver activities would continue to be executed at designated maneuver training areas. This would damage or remove vegetation and disturb soils to an extent that could increase soil erosion rates and alter drainage patterns in the training areas, which could lead to gullying, and indirectly to downstream sedimentation, particularly when the vehicles travel off-road. Mitigation measures, implementation of the ITAM annual work plan, and BMPs are followed to minimize soil loss and mitigate impacts to a less than significant level.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Impacts from soil erosion are anticipated to be beneficial overall, with short-term minor impacts from increased demolition activities. Alternative 1 includes the reduction of no longer needed facilities that could result in short-term adverse impacts from demolition and temporary exposure of bare soils to rain and water and wind erosion; however, these impacts would be short term in duration. Exposed areas of soil after deconstruction would likely be reseeded with native species to reduce the impacts from fugitive dust. Consequently, minor soil erosion impacts from deconstruction activities at USAG-HI are anticipated.

The number of required live-fire user days per year at USAG-HI would drop below current levels by approximately 10 percent. Weapons firing can involve the disturbance of vegetation and soils, which can cause increases in soil erosion rates. Implementation of the INRMP and ITAM program work plans and associated management practices along with additional soil erosion mitigation measures would continue. Consequently, impacts to soil erosion from a reduction in live-fire training would be negligible to minor impact as fewer opportunities for soil erosion would occur.

The intensity and frequency of maneuver training at USAG-HI would also decrease below current levels. In addition, no new maneuver areas would be required and maneuver training would be conducted in the footprint of existing ranges and trails at USAG-HI. Implementation of the INRMP and ITAM program work plans and associated management practices along with additional soil erosion mitigation measures would continue. Consequently, impacts to soil erosion from a reduction in live-fire training would be minor.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There is anticipated to be significant but mitigable impacts to soil resources at USAG-HI on both O'ahu and at PTA resulting from the implementation of Alternative 2. Alternative 2 would involve the demolition of some facilities and construction of new facilities within the existing cantonment area resulting in short- and long-term minor impacts. At SBMR, short-term impacts would occur as infill construction in the cantonment area would take place among existing structures. Stormwater management practices would be implemented to mitigate potential adverse effects from sediment runoff. Long-term effects could occur from the compaction of soils, reducing the likelihood for vegetation to re-establish itself and increasing the effects from wind erosion or precipitation. Soils transported away from the construction area may accumulate in gullies or to other areas where post-precipitation event water may carry sediments to other waterbodies. Other direct long-term effects would include a change in soil function due to permanent modification of the area (construction of a building on top of previously undisturbed soil).

Any range construction and expansion projects would have similar impacts to soils as would cantonment construction. These projects would be subject to site-specific NEPA analysis. There are not any range projects currently known to be required to support Alternative 2. Heavy construction machinery or vehicles would disturb the soil surface through excavation, digging of wheels into the surface media, and physically moving soils from place to place. Short-term effects would occur from soil transport and loading into nearby waterbodies. Fugitive dust may also occur; however, impacts from dust would likely be localized and not have any lasting adverse effects to nearby waterbodies. Long-term minor direct effects would occur from the loss of vegetation, exposing the soils beneath; and may also include the compaction of some soils making it difficult to support future vegetative growth; and permanent modification of soil function. The installation would continue to use existing construction BMPs to mitigate any potential effects.

Implementation of Alternative 2 would increase the frequency of live-fire activities on ranges by 10 to 15 percent, potentially causing a greater amount of soil disturbance. Weapons firing typically involves the disturbance of soils, denuding the soil surface of vegetation, and increasing the erodibility of soils. USAG-HI DPW staff monitor impacts from live-fire activities and would continue to institute the required mitigations and BMPs (such as berm revegetation and regrading) to minimize sediment migration off the firing ranges.

For Combat Support units, the use of ordnance or explosives could cause wildfires resulting in the removal of vegetation that normally protects soil from erosion. The presence of vegetation slows surface water runoff by intercepting raindrops before they reach the soil surface, and works to anchor the soil with roots. Without surface vegetation, the top layer of soils may be transported away due to natural processes, and the soil remaining may become compacted leaving little opportunity for vegetation to re-establish itself. Vegetation removal resulting from wildland fires could result in increased soil erosion by water and wind, indirectly causing large-scale removal and redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. The impact would be directly proportional to the size of the fire. Without surface vegetation, the top layer of soils may be transported away due to natural processes, and the soil remaining may become compacted leaving little opportunity for vegetation (especially native vegetation) to re-establish itself. Vegetation removal resulting from wildland fires could result in increased soil erosion by water and wind, indirectly causing large-scale removal and redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. The impact would be directly proportional to the size of the fire. Under natural conditions, wildland fires occur infrequently in Hawai`i. Thus, native plant species are not well

adapted to fire. Fire and loss of soil could reduce native plant species and encourage fast-growing non-native species that recover quickly after fires. Some of these species may be more susceptible, or even dependent, on fire so that the occurrence of wildland fires may help to increase the chance of future wildland fires. The installation's Wildfire Management Plan would be utilized to minimize the effects of live-fire activities to vegetation while maintaining effects to a manageable area.

Units operating at impact areas in the summer can directly create craters and remove patches of vegetation, which normally protect soil from erosion by slowing runoff, intercepting raindrops before they reach the soil surface, and anchoring the soil. Compaction in the craters caused by larger ordnance explosions can alter the permeability and water-holding capacity of the soils affecting the ability of vegetation to recover in those areas. These direct impacts indirectly create large areas of bare ground and exposed soils that are susceptible to wind and water erosion, which can indirectly cause large-scale removal and redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. Although weapons training events would be periodic, long-term impacts are anticipated because soil disturbance typically requires time and effort to amend.

The addition of 1,500 Soldiers may increase the frequency of maneuvers by 10 to 15 percent. The increase in maneuver frequency is anticipated to correlate with resulting damage to vegetation and disturb soils to an extent that would increase soil erosion rates and alter drainage patterns in the training areas. This could lead to gullying, and indirectly to downstream sedimentation, particularly when the vehicles travel off-road. The increased mounted and dismounted traffic on ranges would lead to additional damage to vegetation and soil disturbance. Drum Road would be used by to transport Soldiers, vehicles, and equipment to KTA. The soils in maneuver areas at KTA are generally well drained; however, they have experienced a high rate of loss due to recent training operations. The addition of vehicle maneuvers there may continue to increase the rate of erosion and decrease the sustainability of soils in that training area. Management of soil sustainability at KTA would become more time intensive as more monitoring and mitigation may be required.

DMR would continue to support some maneuver training. Large-scale exercises would be supported at PTA. Less than significant effects on land condition may occur because the land damage would be limited to the existing roads and trails instead of distributed over the entire DMR. As with KTA, the effects would be minimized due to USAG-HI institutional programs to include the ITAM program.

Overall, impacts from Alternative 2 would be projected to have significant but mitigable impacts to soils within USAG-HI with the implementation of mitigation measures described below.

Regulatory and Administrative Measure 1. Installation DPW staff monitor impacts from live-fire activities and would continue to institute the required mitigations and BMPs (such as berm revegetation and regrading) to minimize effects off the firing ranges.

Regulatory and Administrative Measure 2. During range operations and live-fire activities, range officers and firing units are required to carry equipment to put out a small fire and are briefed on procedures for reporting fires to range control for rapid fire prevention response.

Regulatory and Administrative Measure 3. The Army continually funds and implements USAG-HI-wide land management practices and procedures described in the ITAM annual work plan to reduce erosion and other soil and geologic impacts. Currently, these measures include implementing a Training Requirements Integration program, implementing an ITAM program, implementing a Sustainable Range Awareness program, developing and enforcing range regulations, and continuing to implement land rehabilitation projects, as needed, within the

LRAM program. Examples of erosion and sediment control measures identified in the ITAM annual work plan include stormwater runoff control structures (silt fences, hay bales, etc.) as part of standard BMPs, which would divert water from the construction sites. Standard range maintenance BMPs implemented by USAG-HI include road grading, target repair, and berm recontouring. Examples of current LRAM activities at USAG-HI include revegetation projects involving site preparation, liming, fertilization, seeding or hydroseeding, tree planting, irrigation, and mulching; combat trail maintenance program; and development mapping and GIS tools for identifying and tracking progress of mitigation measures.

These mitigation measures would reduce soil erosion impacts from construction to less than significant.

4.18.7 Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species)

4.18.7.1 Affected Environment

This section describes the plant and animal species (biological resources) and habitats that occur in the terrestrial environments within and surrounding USAG-HI. Biological resources include those that are limited in number or habitat or restricted in movement (e.g., plants and small mammals). These resources also include those that are more mobile and can range onto and off the property from surrounding habitat areas (e.g., birds and terrestrial mammals).

The Hawaiian Islands are located over 2,400 miles from the nearest continental shore, isolating these islands from other land masses. Hawai'i is home to a large number of species only found in this geographic area (referred to as endemic species). Endemic species can be classified as found only on the Hawaiian islands (as an archipelago) or to a single Hawaiian island. For example, there are 71 known taxa of endemic Hawaiian birds, 23 are known to be extinct and 30 of the remaining 48 species (and subspecies) are federally-protected as listed species by USFWS. There are 1,094 taxa of native flowering plants found in Hawai'i, 91 percent of which occur only in Hawai'i. Almost half of Hawai'i's native vascular plant taxa (flowering plants, ferns, and fern allies) are believed to be endemic and found nowhere else in the world.

Terrestrial biological resources are divided into three categories: vegetation communities, wildlife, and special-status species. Vegetation consists of terrestrial plants and their habitat types (i.e., shrub land). Wildlife includes invertebrates, amphibians, reptiles, terrestrial mammals, birds, fish, and marine wildlife. For the purposes of this document, protected species include those listed or candidate species under federal and State of Hawai'i laws, locally regulated species, and migratory birds. All Army operations consider any published Biological Opinions, species and habitat listings or recommendations regarding any listed species to protect these species from impact appropriately. The ROI for biological resources consists of the lands that support terrestrial biological resources (i.e., individual species and habitats) that may be directly or indirectly affected by the Proposed Actions. Vegetation, wildlife, critical habitats, and listed species that have been recorded in or that have the potential to be found within this ROI, based on the presence of suitable habitat, are discussed in this section. Biological resources have the potential to be impacted by construction, operations, and training related activities.

The extensive boundaries and variances in elevation on SBMR and its designated training sites provide a wide diversity in wildlife habitats, highly urbanized areas, streams, native forest, and grasslands (U.S. Army, 1995). The ROI for biological resources includes those areas where the extent of maneuver, helicopter, and live fire associated with stationing scenarios would potential pose potential impacts to vegetation and wildlife from human activities such as construction and

training. Therefore, the ROI for these scenarios could include SBMR, South Range, DMR, SBER, KLOA, KTA, Wheeler Army Airfield, and PTA.

This section discusses the affected environment and impacts on biological resources to include vegetation, noxious weeds, threatened and endangered species, habitats, and general wildlife.

Schofield Barracks. Schofield is home to 53 rare plant species, 28 special status wildlife species, 2 rare vegetation communities, and large expanses of Biologically Significant Areas. Vegetative communities descriptions found in the ROI include: a mixed fern and shrub community found in the higher elevations of the Koolau Mountains where rainfall exceeds 150 inches. Falling between 3,200 and 4,000 feet above MSL is the Montane wet ohia forest, dominated largely by the ohia tree. Ohia Shrubland is found at elevations between 2,500 and 3,000 feet above MSL. In areas where conditions are warmer and sheltered from the wind, there are three types of lowland wet communities; these are Ohia forest, Uluhe Shrubland, and the Loulu hiwa forest. Lowland moist communities include the Kawelu grassland, Ohia lowland moist Shrubland, O'ahu diverse forest, and Koa/Ohia forest. Adjacent to these areas are swaths of non-native grasses and shrublands found in fire-disturbed areas.

Kahuku Training Area and Kawailoa Training Area. KTA, which in total encompasses 8,528 acres, is located at the end of the Koolau Mountains, on the northern tip of O'ahu. Private, agricultural, and additional Army training lands border it. Botanical surveys to identify rare plants, communities, and potential threats to these resources have been conducted intermittently since 1977. KLOA is north of SBER and south of KTA in the Koolau Mountains. It consists of 23,348 acres. KLOA was surveyed in 1976 and 1977 by the Environmental Impact Study Corporation and later by Hawai'i National Heritage Program (1989 to 1993). O'ahu Army Natural Resource Program continues to conduct biological inventory surveys. Kawailoa is an area of incredible biological richness, with areas of significance for protecting and managing these resources. Native natural community types within the KTA/KLOA ROI fall into six general categories: montane wet, lowland wet, lowland forest, lowland moist, lowland dry, and intermittent aquatic natural communities**.** The areas in and around KTA and KLOA support 20 species of endangered plants, 6 Species of Concern, and 10 candidate species. KTA and KLOA also support two ecologically sensitive areas and nearly 1,000 acres of biologically sensitive areas. Figure 4.18-3 demonstrates the location of plant critical habitat on O'ahu.

Much of the lower-lying vegetation of the KTA/KLOA ROI is composed of invasive plants. Several of these widespread species create dense single-species stands (Christmas berry, ironwood, strawberry guava) that shade out understory species. Two of the plants that are potentially most devastating to the native communities of KTA are *Chromolaena odoratum* and *Pennisetum setaceum*. Disturbed moist forests are most at risk from these invasions, and efforts are needed to protect the native communities within these boundaries. Most of the wildlife species inhabiting the landscape that makes up the KTA/KLOA ROI are non-native. The Army has been conducting regular zoological field surveys on KTA and KLOA that have focused on special status invertebrates, mammals, and birds. There have been no specific reptile or amphibian surveys on KTA due to the absence of native terrestrial reptiles and amphibians on the Hawaiian Islands.

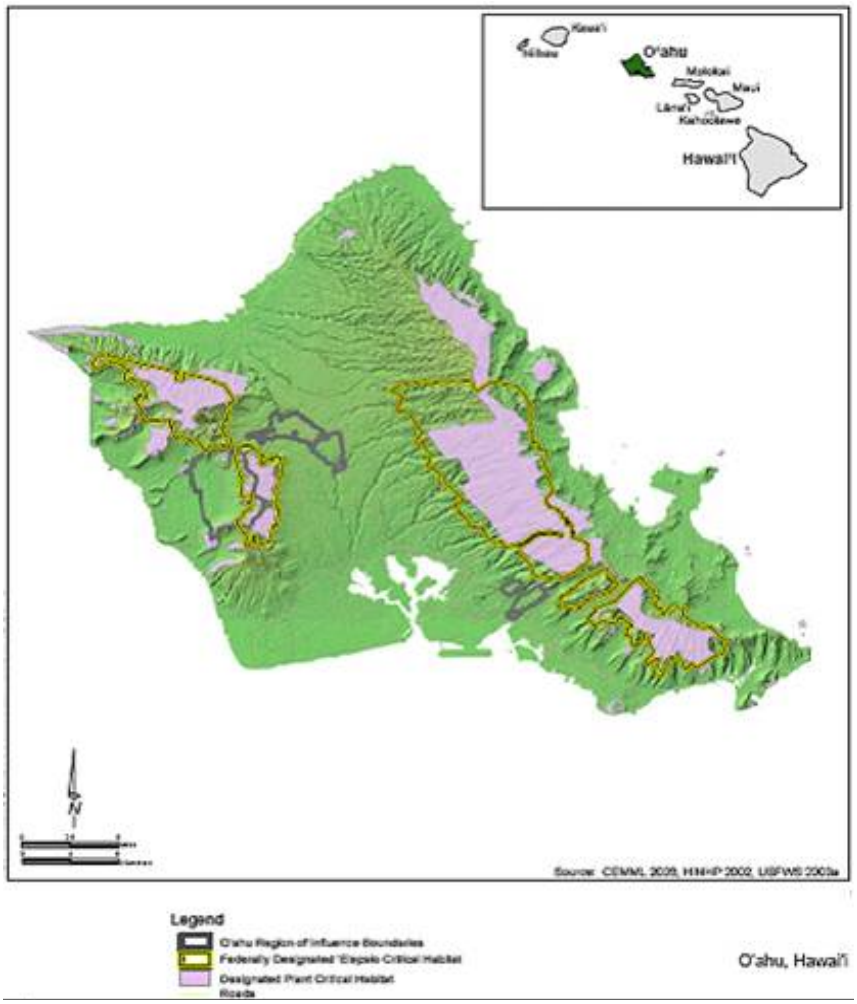

Figure 4.18-3. Plant Critical Habitat on O'ahu

***Dillingham Military Reservation*.** The area surrounding DMR is sparsely populated, and neighboring land is owned either privately or by the State of Hawai`i. Botanical surveys to identify rare plants, communities, and potential threats to these resources have been conducted intermittently since 1977. Hawai'i National Heritage Program surveyed the area in 1995, but the visit was brief due to the small size and rugged terrain of the training area. During this site visit, Hawai'i National Heritage Program staff documented the only known example in Hawai`i of extremely dry closed-canopy forest.

In 2003, the Army initiated a formal consultation with the USFWS by issuing a Biological Assessment for military activities on the Island of O'ahu. The USFWS responded with no Jeopardy Biological Opinion (October 2003) for current force activities and transformation of the 2/25th Brigade to a SBCT on the islands of O'ahu and Hawai`i (USFWS, 2003a and 2003b, respectively). The Biological Opinions was issued under the condition that the listed species that have less than three stable populations and/or more than 50 percent of known individuals occur within the action area be stabilized. The consultation used an action area that encompasses all land potentially affected by military training and thus includes land outside the installation boundaries. Overall, there are 50 full-time staff executing biological opinion requirements year-round.

Pohakuloa Training Area. There are at least 90 species of arthropods and six other invertebrates found on PTA. A 1996 to 1998 survey found 485 taxa of arthropods on PTA. Most taxa were non-native species. Other more recent invertebrate studies determined the presence and location of the Argentine ant (*Linepithema humile*) and other ant species (USAG-HI, 2010).

The ʻopeʻapeʻa, or Hawaiian hoary bat (*Lasiurus cinereus semotus*), is the only native land mammal at PTA. All other mammals are non-native and individual perceptions can affect their designation as game or as an invasive/nuisance species. Common game mammals include feral goat (*Capra hircus*), sheep (*Ovis aries*), and pig (*Sus scrofa*), which, along with rat species (*Rattus rattus*), mongoose (*Herpestes auropunctatuts*), mouse (*Mus domesticus*), domestic cattle (*Bos Taurus*), domestic horse (*Equus caballus*), feral dogs (*Canis familiaris*), and feral cats (*Felis catus*) are considered nuisance species and harmful to the persistence of many native species (USAG-HI, 2010).

Twelve endemic (native) bird species are present at PTA, along with 25 introduced (non-native) or visitor bird species. Many of the introduced (non-native) species are considered game birds. Seventeen of the bird species are protected by the MBTA, almost half of which are introduced (non-native) or visitor species that have established populations.

Approximately 38 percent of the plants found on PTA are indigenous (endemic, native) and the remaining are non-native species (USAG-HI, 2010). There are numerous vegetation communities on PTA. Introduced plant species make up a significant portion of many of these habitats, and introduced plants are components in all habitats on PTA. PTA's habitats include bare ground, grassland, lava, scrub, and sparse trees. Barren lava covers 25 percent of the installation. Lichens, such as lava lichen (*Stereocaulon vulcani*), and ferns, such as cliffbrake (*Pelaea ternifolia*), are the first colonizers of these flows, although fountain grass is beginning to invade these barren areas.

As previously mentioned, PTA does not contain waterbodies to support aquatic fauna. Therefore, there are no native amphibians, reptiles, fish, or marine wildlife on PTA (USAG-HI, 2010). Surveys and studies have been conducted for listed vegetation, habitat, and wildlife species at PTA since the 1970s. Surveys for special species of wildlife on PTA first occurred in 1976. Since 1980, annual surveys for palila (*Loxioides bailleui*) in the Mauna Kea region are administered by the Hawaiʻi State Department of Land and Natural Resources, Division of Forestry and Wildlife, with assistance from USFWS. In 1990, bird and mammal surveys were conducted at PTA. Plant and wildlife surveys have been conducted regularly between 1996 and 2010. Annual avian surveys, with a focus on listed species, have been conducted on PTA since 1997.

Due in part to the presence of listed wildlife and critical habitat on PTA, the U.S. Army initiated formal ESA, Section 7 consultation with the USFWS for Routine Military Training and Transformation of the 2/25th SBCT. In 2003, a Biological Opinion was provided, which required specific conservation measures and nondiscretionary terms and conditions to be implemented by the U.S. Army. These measures were intended to ensure the continued existence of the federally-listed species found at PTA. One of the main requirements is to construct large-scale fence units, and maintain these fence units ungulate-free. Fence units are completed on Western PTA, and currently encompass approximately 28,000 acres of conservation management areas. A large-scale fence unit on Eastern PTA (Training Area 21) is currently under construction, and would encompass approximately 12,000 acres.

In 2008, the U.S. Army reinitiated the Section 7 consultation with the USFWS because nenes were utilizing a live-fire range and attempted to nest in the KMA (USFWS, 2008). The 2008 Biological Opinion mainly addresses impacts of new construction, training, and conservation actions that may affect the nene (USFWS, 2008).

There are 15 federally-listed plant species at PTA. Three of the endangered plant species are located in the KMA. The Army considers federal candidate species and state-listed species as species at risk. No critical habitat is present for listed plant species present at PTA. Endangered plants such as kio'ele (*Kadua coriacea*) and Mauna Kea pamakani (*Tetramolopium arenarium var. arenarium*), have been identified in the western portion of PTA. The Kīpuka Kālawamauna Endangered Plants Habitat 7,853 acres is located in the northwest corner of PTA between the impact area and the historic boundary in portions of Training Areas.

Table 4.18-4 presents the threatened and endangered species found on USAG-HI.

Table 4.18-4. Threatened and Endangered Species found on U.S. Army Garrison-Hawai'i

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Schiedea obovata		E	Plant	MMR	2000	Y	Y				Y		
Bonamia menziesii		E	Plant	MMR	2000	N	Y				Y		
Chamaesyce celastroides var. kaenana	`Akoko	E	Plant	MMR	2000	Y	Y				Y		
Chamaesyce herbstii	`Akoko	E	Plant	MMR	2000	Y	Y				Y		
Colubrina oppositifolia			Plant CH	MMR		N	Y						
Cyanea longiflora	Haha	E	Plant	MMR	2000	Y	Y				Y		
Cyanea superba spp. suberba	Haha	E	Plant	MMR	2000	Y	Y				Y		
Dubautia herbstobatae	Na`ena`e	E	Plant	MMR	2000	Y	Y				Y		
Euphorbia haeleeleana		E	Plant	MMR	2000	N	Y				Y		
Gouania vitifolia		E	Plant	MMR	2003	Y	Y				Y		
Hedyotis degeneri degeneri		E	Plant	MMR	2000	Y	Y				Y		
Hedyotis parvula		E	Plant	MMR	2000	Y	Y				Y		

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Isodendrion laurifolium			Plant CH	MMR			Y						
Isodendrion longifolium			Plant CH	MMR			Y						
Isodendrion pyrifolium			Plant CH	MMR			Y						
Lipochaeta tenuifolia	Nehe	E	Plant	MMR	2000	Y	Y				Y		
Mariscus pennatiformis			Plant CH	MMR			Y						
Melicope pallida			Plant CH	MMR			Y						
Nototrichium humile	Kulu`I	E	Plant	MMR	2005	Y	Y				Y		
Sanicula mariversa		E	Plant	MMR	2000	Y	Y				Y		
Solanum sandwicense			Plant CH	MMR			Y						
Spermolepis hawaiiensis		E	Plant	MMR	2000	N	Y				Y		
Hibiscus brackenridgei spp. mokuleianus	Ma`o hau hele	E	Plant	MMR, DMR	2005	Y	Y			Y	Y		
Cyrtandra dentata	Ha`iwale	E	Plant	MMR, KLOA	2000	Y	Y				Y		Y

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Cyanea grimesiana spp. obatae	Haha	E	Plant	MMR, SBMR	2005	Y	Y	Y			Y		
Delissea subcordata	Haha	E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Diellia falcata		E	Plant	MMR, SBMR	2000	N	Y	Y			Y		
Flueggea neowawraea	Mehamehame	E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Hesperomannia arbuscula		E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Neraudia angulata	Ma`aloa	E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Phyllostegia kaalaensis		E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Plantago princeps princeps	Ale	E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Schiedea hookeri		E	Plant	MMR, SBMR	2000	N	Y	Y			Y		
Schiedea kaalae		E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		
Schiedea nuttallii var. nuttallii		E	Plant	MMR, SBMR	2000	Y	Y	Y			Y		

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Chasiempis sandwichensis ibidis	O'ahu `Elepaio	E	Bird	MMR, SBMR,	2000	Y	Y	Y			Y		
Cyperus trachysanthos		E	Plant	DMR	2000	Y				Y			
Fulica alai	Hawaiian Coot	E	Bird	DMR	2009	N				Y			
Gallinula chloropus sandvicensis	Common Moorhen	E	Bird	DMR	2009	N				Y			
Himantopus mexicanus knudseni	Black necked stilt	E	Bird	DMR	2009	N				Y			
Schiedea kealiae		E	Plant	DMR	2000	N				Y			
Achatinella apexfulva	*Pupu Kuahiwi*	E	Snail	KLOA	1998	Y							Y
Achatinella bulimoides	*Pupu Kuahiwi*	E	Snail	KLOA	1985	Y							Y
Achatinella lila	*Pupu Kuahiwi*	E	Snail	KLOA	2002	Y							Y
Achatinella livida	*Pupu Kuahiwi*	E	Snail	KLOA	2002	Y							Y
Achatinella pulcherima	*Pupu Kuahiwi*	E	Snail	KLOA	1993	Y							Y
Cyanea crispa	Haha	E	Plant	KLOA	2000	Y							Y
Cyanea humboldtiana	Haha	E	Plant	KLOA	2000	N							Y

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Megalagrion leptodemas	Crimson Hawaiian Damslelfy	P	Insect	KLOA		N							Y
Megalgrion nigrohamatum spp. nigrolineatum	Blackline Hawaiian Damselfly	P	Insect	KLOA		N							Y
Megalagrion oceanicum	Oceanic Hawaiian Damselfly	P	Insect	KLOA	2008	Y							Y
Melicope lydgatei	Alani	E	Plant	KLOA	2000	Y							Y
Myrsine juddii	Kolea	E	Plant	KLOA	2001	Y							Y
Phyllostegia parviflora		E	Plant	KLOA	2000	N							Y
Psychotria hexandra ssp oahuensis	Kopiko	P	Plant	KLOA		Y							Y
Achatinella curta	*Pupu Kuahiwi*	E	Snail	KLOA, KTA	1989	Y						Y	Y
Achatinella byronii/ decipiens	*Pupu Kuahiwi*	E	Snail	KLOA, SBER	2000	Y			Y				Y
Chamaesyce rockii	`Akoko	E	Plant	KLOA, SBER	2005	Y			Y				Y
Cyanea st.-johnii	Haha	E	Plant	KLOA, SBER	2000	Y			Y				Y

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Cyrtandra viridiflora	Ha`iwale	E	Plant	KLOA, SBER	2000	Y			Y				Y
Phlegmariarus nutans		E	Plant	KLOA, SBER	2000	Y			Y				Y
Pteris lidgatei		E	Plant	KLOA, SBER	2000	Y			Y				Y
Sanicula purpurea		E	Plant	KLOA, SBER	2000	Y			Y				Y
Viola oahuensis		E	Plant	KLOA, SBER	2000	Y			Y				Y
Achatinella sowerbyana	*Pupu Kuahiwi*	E	Snail	KLOA, SBER, KTA	2002	Y			Y			Y	Y
Tetraplasandra gymnocarpa	`Ohe`ohe	E	Plant	KLOA,KTA, SBER	2000	N			Y			Y	Y
Eugenia koolauensis	Nioi	E	Plant	KTA	2005	Y						Y	
Abutilon sandwicense		E	Plant	MMR	2003	N					Y		
Bidens amplectens	Kookolau	P	Plant	MMR		N					Y		
Cyanea dentata	Haha	E	Plant	MMR	2000	N					Y		
Korthalsella degeneri	Hulumoa	P	Plant	MMR		Y					Y		

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Melicope makahae	Alani	P	Plant	MMR		Y					Y		
Peucedanum sanwicense	Makou	E	Plant	MMR	2005	N					Y		
Platydesma cornuta var decurrens		P	Plant	MMR		N					Y		
Pleomele forbesii	Hala Pepe	P	Plant	MMR		N					Y		
Silene lanceolata		E	Plant	MMR	2000	N					Y		
Tetramolopium filiforme		E	Plant	MMR	2000	Y					Y		
Lobelia oahuensis	Haha	E	Plant	MMR, KLOA, SBER, SBMR	2000	Y		Y	Y		Y		Y
Achatinella mustelina	*Pupu Kuahiwi*	E	Snail	MMR, SBMR	2000	Y		Y			Y		
Alectryon macrococcus var. macrococcus	`Ala `alahua, mahoe	E	Plant	MMR, SBMR	2000	Y		Y			Y		
Cenchrus agrimonioides var. agrimonioides	Kamanomano	E	Plant	MMR, SBMR	2005	Y		Y			Y		

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Ctenitis squamigera	Pauoa	E	Plant	MMR, SBMR	2000	N		Y			Y		
Isodendrion longifolium	Aupaka	E	Plant	MMR, SBMR	2000	N		Y	Y				
Lepidium arbuscula	`Anaunau	E	Plant	MMR, SBMR	2000	N		Y			Y		
Lobelia niihauensis	Haha	E	Plant	MMR, SBMR	2000	N		Y			Y		
Pritchardia kaalae	Loulu	E	Plant	MMR, SBMR	2000	Y		Y			Y		
Viola chamissoniana spp. chamissoniana	Pamakani	E	Plant	MMR, SBMR	2000	Y		Y			Y		
Pteralyxia macrocarpa	Kaulu	P	Plant	MMR, SBMR, KLOA, KTA		N		Y			Y	Y	Y
Cyrtandra subumbellata	Ha`iwale	E	Plant	SBER	2000	Y			Y				
Lobelia gaudichaudii spp. koolauensis	Haha	E	Plant	SBER	2001	Y			Y				

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Melicope christophersenii	Alani	P	Plant	SBER		Y			Y				
Melicope hiiakae	Alani	P	Plant	SBER, KLOA		Y			Y				Y
Platydesma cornuta var cornuta		P	Plant	SBER, KLOA		Y			Y				Y
Zanthoxylum oahuense	Ae	P	Plant	SBER, KLOA		N			Y				Y
Cyanea koolauensis	Haha	E	Plant	SBER, KTA, KLOA	2000	Y			Y			Y	Y
Abutilon sandwicense		E	Plant	SBMR	2005	Y		Y					
Alsinidendron trinerve		E	Plant	SBMR	2000	Y		Y					
Drosophila montgomeryi	Pomace Fly	E	Insect	SBMR	2009	Y		Y					
Labordia cyrtandrae	Kamakahala	E	Plant	SBMR	2000	Y		Y					
Phyllostegia mollis		E	Plant	SBMR	2000	Y							
Stenogyne kanehoena		E	Plant	SBMR	2005	Y		Y					
Urera kaalae	Opuhe	E	Plant	SBMR	2000	Y		Y					

Scientific Name	Common Name	Status	Plant or Animal	Installations	Last Obs	Stabilization?	MMR CH	SBMR	SBER	DMR	MMR	KTA	KLOA
Cyanea calycina	Haha	P	Plant	SBMR, KLOA		Y		Y			Y		
Cyanea lanceolata	Haha	P	Plant	SBMR, KLOA		N		Y					Y
Cyanea acuminata	Haha	E	Plant	SBMR, KLOA, SBER	2000	Y		Y	Y				Y
Hesperomannia arborescens		E	Plant	SBMR, KLOA, SBER	2000	Y		Y	Y				Y
Phyllostegia hirsuta		E	Plant	SBMR, KLOA, SBER	2000	Y		Y	Y				Y
Gardenia mannii	Nanu, na`u	E	Plant	SBMR, KTA, KLOA, SBER	1994	Y		Y	Y			Y	Y
Drosophila substenoptera	Pomace Fly	E	Insect	SMBR	2009	Y		Y					
Megalagrion xanthomelas	Orangeblack Damselfly	C	Insect	TAMC	2009								

DMR = Dillingham Military Reservation; KLOA = Kawailoa Training Area; KTA = Kahuku Training Area; MMR = Makua Military Reservation; SBER = Schofield Barracks East Range; SBMR = Schofield Barracks Military Reservation; TAMC = Tripler Army Medical Center

4.18.7.2 Environmental Consequences

No Action Alternative

No additional impacts would occur under the No Action Alternative and impacts would remain significant but mitigable. USAG-HI would continue to adhere to its existing resource management plans and INRMP (USAG-HI, 2010) to further minimize and monitor any potential effects. Units are briefed prior to each training event regarding sensitive areas on post, such as protected species habitat, and what is and is not allowed within certain areas. Construction of cantonment and range projects would proceed as they are planned, and would occur in previously disturbed areas. Live-fire and maneuver training would continue, disturbing wildlife by noise and human presence. Training could increase the risk of wildfire, and mitigation measures are in place to minimize that risk. Continued use of Army lands would impact sensitive species, but not have significant, adverse impacts.

Vegetation communities within the proposed range areas on SBMR, KTA, PTA, and KLOA would continue to be disturbed by live-fire training. Army use of those ranges would produce a less than significant impact to threatened and endangered species because live-fire training would occur over a larger area and at more locations. Continued use of Army land for training would increase live-fire training and the potential for wildfires, though mitigations are in place to ensure rapid response and minimization of wildfire damage. Several fire mitigation measures are being implemented throughout the garrison on existing ranges and would continue.

Training with existing vehicles would continue at current levels. Maneuver training would occur on established roads or trails, as well as areas designated for maneuver training throughout the installation. Wildlife would continue to be disturbed by noise and human presence during training, but the level of disturbance would not change from existing levels and remain a less than significant impact. Maneuver training could potentially increase the frequency of wildfires. Several fire mitigation measures are being implemented throughout the garrison on existing maneuver ranges and would continue. Impacts from continued training would remain mitigable to less than significant impact.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Beneficial impacts to biological resources as a result of the implementation of Alternative 1 are anticipated. Training would decrease by up to 30 percent as a result of implementation of this scenario. Access to range areas to conduct management and resource monitoring would increase. Proactive conservation management practices and species monitoring would be more easily accomplished with reduced mission throughput. The land within the main cantonment area where deconstruction would occur does not support any critical habitat or threatened or endangered species, or Species of Concern. This area is highly disturbed and used by humans daily. Activities associated with demolition actions (increase in vehicles and human presence) creates noise and disturbs wildlife; however, these activities have not shown to be detrimental to foraging behavior or reproductive success, but this observance may vary by location, species, and type of human activity. The impacts to wildlife from deconstruction on the garrison are anticipated to be negligible.

The number of required live-fire user days per year at USAG-HI would drop below current levels. A reduction in live-fire training related wildfires is anticipated as well as reduced impacts to fish and wildlife and vegetation. Reducing the number of Soldiers stationed at USAG-HI would open up opportunities for more management, recreation, and subsistence activities.

The intensity and frequency of maneuver training at USAG-HI would drop below current levels resulting in less wildlife and vegetation disturbance. Training would be conducted in the footprint

of existing ranges and trails at USAG-HI. Reduced impacts to fish, wildlife and vegetation would be similar to that discussed for live-fire training.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Significant but mitigable impacts would be anticipated on both the Island of O'ahu and the Big Island of Hawai'i as a result of the implementation of Alternative 2. The increase in the number of Soldiers would increase training activity by a projected 10 to 15 percent above the current level.[3] While this moderate force augmentation would increase traffic in the training lands and ranges, it would not cause significant degradation or destruction of rare or sensitive species habitats.

Cantonment Construction. The land within the main cantonment area where construction and deconstruction would occur does not support any critical habitat, threatened or endangered species, or Species of Concern. Construction can introduce invasive species and other weeds through the use of sand and gravel that contains non-native plant seeds. Impacts from facilities construction in existing disturbed footprints is anticipated to be less than significant.

Mitigation measures, planning considerations, and BMPs contained in the INRMP, Integrated Wildland Fire Management Plan, Biological Opinions, O'ahu Implementation Plan, and other guidance documents would minimize impacts to biological resources from invasive species to a significant but mitigable level.

The O'ahu Implementation Plan identifies additional management actions, beyond those already used by the Army, needed to stabilize these target taxa. Live-fire training from this scenario would fall within the levels of training that the Army has consulted with the USFWS service on as part of the last Biological Opinion. If at any time there is a change in the training areas or action areas, a change in the potential impacts to the species in the action area, a change in the species status, or the discovery of additional taxa, the Army is required to reinitiate consultation with the USFWS pursuant to Section 7 of the ESA. Examples of mitigation measures that would be implemented under the current proposed training scenarios by the Army at potential impact sites on O'ahu include:

- Enclosure fencing of sensitive plant species to eliminate impacts from human disturbance and ungulates;
- Development and implementation of a fire fuel reduction plan;
- Development and implementation of an alien rat control plan to protect sensitive species;
- Expand monitoring programs in potential areas of impact for sensitive species;
- Establish signage to identify areas that are off limits due to the presence of federally-listed species; and
- Provide education for each set of new Soldiers regarding the importance of avoiding listed species and disturbance to their habitats.

In general, invasive plant species pose a threat to Native Hawaiian ecosystems. Movement of equipment into Hawai'i from continental U.S. or foreign ports, as well as from other islands or subinstallations within Hawai'i, would increase the likelihood of non-native plant and animal introductions. In addition, initial transport of vehicles associated with new stationing would also elevate this threat, even though shipped vehicles go through the USDA and customs inspections as part of standard procedure.

[3] At PTA, it is not known if the increased training would exceed historically authorized levels. If this were the case, additional NEPA analysis would be required.

The impact of stationing actions on the spread of invasive species would be lessened by instituting the Army's ongoing environmental programs. Measures identified in the O'ahu Training Areas INRMP (USARHAW and 25th Infantry Division[L] 2010), the Biological Opinion for the Island of O'ahu (USFWS, 2003a), the *Transformation EIS* (USAG-HI, 2004), and the Implementation Plan for O'ahu Training Areas (USAG-HI, 2008) for protection of biological resources and mitigations proposed as part of the ROD for the 2/25th SBCT Stationing EIS (2008) would continue as a result of the proposed SBCT project actions.

USAG-HI would follow DA guidance developed in consultation with the Invasive Species Council and compliance with E.O. 13112, which determines federal agency duties with regard to preventing and compensating for invasive species impacts. The implementation of an Environmental Management System would further improve the identification and reduction of environmental risks inherent in mission activities. Mitigation for Impacts from noxious weeds related to Construction and Training, as required in the terms and conditions of the Biological Opinion (USFWS, 2003a), include:

- Educating Soldiers and others potentially using the facilities and roads in the importance of cleaning vehicles, equipment, and field gear;
- Educating contractors and their employees about the need to wear weed-free clothes and maintaining weed-free vehicles when coming onto the construction site and avoiding introducing non-native species to the project site;
- Preparing a one-page insert to construction contract bids informing potential bidders of the requirement; and
- Inspecting and washing all military vehicles at wash rack facilities prior to leaving SBMR, KTA/KLOA, or PTA to minimize the spread of weeds, such as fountain grass, and animal (invertebrate) relocations.

***Live-Fire Training*.** The added small arms fire and weapons qualifications would have significant but mitigable impacts to biological resources as a result of all alternatives. This action would not involve introducing new types of weapons systems to Hawai'i nor would it involve an increase in live-fire training over the capacity thresholds that the Army has discussed with the USFWS as part of the 2003 Biological Opinion. No new Section 7 consultation would be required. The type and intensity of live-fire activities is not anticipated to change; however, the frequency of live-fire training on select live-fire ranges would increase by approximately 10 to 15 percent. It is anticipated that more than 96 percent of the munitions fired on these ranges would be small arms and machine gun munitions. Despite the limited nature of changes in live-fire training activities, the potential increase in wildfires resultant with the proportional increase in live-fire activities of all stationing scenarios would be significant though mitigable through the measures discussed below. An increase in fires could result in direct mortality of sensitive species and would also result in an increase in the spread of noxious weeds, loss of vegetative cover, and potential loss of soils from exposure to wind and water erosion.

Regulatory and Administrative Measure 1. In addition to the general mitigation measures already being implemented (Integrated Wildland Fire Management Plan, Soldier Education, Fuel Reduction) and discussed at the beginning of this section, several fire mitigation measures are being implemented throughout the garrison on existing ranges and would be in place as a result of all alternatives. These mitigations include:

- **SBMR:** Two fire access roads at SBMP, one existing road surrounding the McCarthy Flats ranges and a second road encompassing the South Range would be constructed. Dip ponds would be constructed at SBMP and South Range. A new fire access road would be constructed roughly following the western edge of the

existing pineapple fields at South Range. These mitigations are designed to minimize impacts from wildfires.

- **DMR:** A fire access road is planned for DMR. Fuel modification projects under consideration at DMR are maintenance of fuels along the Dillingham Military Vehicle Trail and may include prescribed burns. Areas that are overgrown would be managed through the application either of herbicide or by cutting the grass or shrubs. Prescribed burning would be used within the finished fire access road.

At KTA, non-live-fire training with pyrotechnic devices still has the potential to ignite wildfires; and the increased number of Soldiers training would increase the risk to causing wildfires.

The number of noise-generating events would increase proportionately with the increase in live-fire activity. Generally speaking, the quality and availability of habitat selection (for wildlife) tend to outweigh noise disturbance generated in that habitat, especially if the noise is not continuous, which is true for live-fire ranges. Live-fire ranges accommodate scheduled training, scheduled maintenance, and are not open year-round.

The noise response to military activities has been studied on a single Hawaiian species, *Chasiempis sandwichensis ibidus* (elepaio). VanderWerf (2000) recorded two responses to 238 artillery blasts. Both cases concerned an incubating male that was preening and had his head down at the time of the blast. The bird appeared to locate the source of the sound and returned to preening in seconds. When bird behavior was compared between Schofield Barrack's sites with a site without artillery blasts (Honouliuli Reserve), there was no statistical difference in incubation or nestling stages. Both attendance and hourly feeding rates were the same. Nest failure was the same between the two sites. Even with varying levels of sounds, there were no perceived effects. Distance is often the single most important predictor of response, followed by duration of the disturbance, visibility, number of disturbances per event, and stimulus position relative to the affected individual.

Maneuver would occur within the footprint of existing training areas at KTA, KLOA, SBER, SBMR, South Range, PTA, and DMR. Maneuver training would not change in intensity or type of use on O'ahu training areas or at PTA, though frequency of maneuver training events is anticipated to increase. Maneuver activities are projected to increase by between 10-15 percent at maneuver training sites within USAG-HI. These impacts would result in an associated risk of distribution of invasive species among training sites.

At SBMR and PTA, training would occur in existing maneuver areas. Maneuver impacts would result in a reduction of vegetative groundcover and may increase the risk for establishment of non-native vegetation in these areas. Habitats and wildlife would be impacted by loss of vegetation, deterring wildlife from foraging in these areas. Habitats that would be impacted on SBMR consist primarily of non-native vegetation.

Maneuvers would continue to occur throughout portions of SBER. Wildlife and vegetation found in this highly disturbed area is primarily non-native. Ground-dwelling wildlife and vegetation would be adversely impacted as a result of the increase in maneuvers. The increased use of trails under this scenario could result in the increase in the propagation of invasive species between training areas.

South Range was previously used for intensive agriculture. Potential increases in maneuver on existing trails may impact biological communities of the South Range through an increase in noise-generating events, potential further degradation of vegetation and soils (which could indirectly impact surface water) near the existing trail infrastructure, and through the potential for wildfire ignition. As discussed above, wildlife may adjust to the increase in noise-generating events; and the installation's ITAM and maintenance programs would continue to monitor and

mitigate impacts from increased maneuver events. As indicated above, fire mitigation measures are being implemented throughout the garrison on existing ranges and would be in place as a result of implementation of all alternatives.

At DMR, maneuver training would occur on established roads or trails, as well as areas currently designated for maneuver training throughout the installation, and may not affect native habitats. The natural communities within the boundary of DMR are two types of lowland dry communities that are on the cliff slopes at the southern end of the training area. These areas may not be used for maneuver training and therefore may not be affected.

The slopes at KTA are steep, and training activities are generally limited by the topography to dismounted maneuvers and vehicle travel on established roads. Vegetative regrowth is fairly rapid. The majority of the training area is non-native vegetation and common native plants, primarily grasses and shrubs, which typically colonize denuded areas quickly and thoroughly. Sensitive plant and wildlife species occur on KTA/KLOA. Manuka and heirba del solado are non-native plants that have recently been discovered in the ROI. USAG-HI would continue to implement their invasive species management programs to minimize the spread of these species throughout the training area.

At PTA, impacts to vegetation and general wildlife from the introduction of invasive species from additional live-fire training activities occurring within the general range area would be a significant impact mitigable to less than significant.

Overall, the impacts to biological resources from implementing Alternative 2 would be anticipated to be significant but mitigable.

Regulatory and Administrative Measure 1. The Army continually funds and implements USAG-HI-wide land management practices and procedures described in the ITAM annual work plan to reduce erosion and other soil and geologic impacts. Currently, these measures include implementing the ITAM program, implementing a Sustainable Range Awareness program, developing and enforcing range regulations, and continuing to implement land rehabilitation projects, as needed, within the LRAM program. Examples of erosion and sediment control measures identified in the ITAM annual work plan include stormwater runoff control structures (silt fences, hay bales, etc.) as part of standard BMPs, which would divert water from the construction sites. Standard range maintenance BMPs implemented by USAG-HI include road grading, target repair, and berm recontouring. Examples of current LRAM activities at USAG-HI include revegetation projects involving site preparation, liming, fertilization, seeding or hydroseeding, tree planting, irrigation, and mulching; combat trail maintenance program, coordination through the TCCC on road maintenance projects; and development mapping and GIS tools for identifying and tracking progress of mitigation measures. These mitigation measures would reduce loss of vegetation and biological soil components associated with maneuver training.

Regulatory and Administrative Measure 2. Use of mitigation measures, planning considerations, and BMPs contained in the INRMP, Integrated Wildland Fire Management Plan, Biological Opinions, O'ahu Implementation Plan, and other guidance documents would minimize impacts to biological resources from invasive species to a significant but mitigable level.

4.18.8 Wetlands

4.18.8.1 Affected Environment

Table 4.18-5 identifies the wetlands and waterbodies examined as a part of recent wetlands inventories. Information on wetland types, hydrology, vegetation types, and locations in the document titled *Wetlands of USARHAW, Island of O'ahu, Hawai`i* (September, 2005).

Table 4.18-5. Summary of Wetlands and Water Bodies on U.S. Army Garrison-Hawai'i Properties

Garrison Property and Wetland Type	Wetlands and Water Bodies (acres)	Likely Wetlands, not Delineated (acres)	Regulated Wetlands (acres)
Schofield Barracks Main Post	**74.1377**	**72.8457**	**0**
South Range California Grass Areas	1.2920	0	0
Mount Ka'ala	72.8457	72.8457	0
Schofield Barracks East Range	**30.0616**	**0.4001**	**1.9112**
Ku Tree Dam and Reservoir	25.6334	0	0
Ko'olau Reservoir	1.0967	0	1.0967
NWI "Wetland"	0.7112	0	0
Cannon Dam Reservoir	1.9601	0	0
Sedge Pond	0.1713	0	0.1713
Bowl Wetland	0.6432	0	0.6432
KimChiMizu Waterbody	0.4001	0.4001	0
Kahuku Training Area	**2.2130**	**0**	**0.0588**
Ponded Water at O'io Stream	0.5038	0	0
Onion Pond	0.0588	0	0.0588
Kaunala Gulch Waterbody	0.7542	0	0
North California Grass Meadow	0.4074	0	0
Central California Grass Meadow	0.3187	0	0
South California Grass Meadow	0.1701	0	0
Kawailoa Training Area	**3.4515**	**3.0361**	**0**
Pe'ahinai 'a Pond	0.3160	0.3160	0
Lehua Makanoe Bog	1.2351	1.2351	0
Poamoho Pond	1.4850	1.4850	0
Frog Pond	0.4154	0	0
Dillingham Military Reservation	**14.2472**	**0**	**0.0834**
California Grass Meadow (north)	2.6527	0	0
California Grass Meadow (south)	11.5064	0	0
California Grass at Drainage Swale	0.0047	0	0
Perched wetland	0.0834	0	0.0834

There are two waterbodies located on SBMP and eight located at SBER. Figure 4.18-4 shows the location of Lake Wilson and a portion of the South Range area (bottom left).

Figure 4.18-4. Location of Lake Wilson (center of map) as Compared to the South Range Acquisition Area

Of the eight waterbodies located at East Range, three are classified as regulated wetlands. Waterbodies there include the Ku Tree Dam and Reservoir area, constructed in 1925; the Koolau Reservoir located in training area ER-12; there is an unnamed wetland feature located on the northern bank of the south fork of Kaukonahua stream (a non-regulated wetland); Canon Dam and its upstream reservoir; Frog Pond located on the southeast side of Wintera Trail; the Sedge Pond; the Bowl wetland; and the KimChiMizu waterbody.

Four waterbodies are present on KTA. Three of these are located in high elevation areas at the installation's southern boundary. There is a pond along the O'io Stream which was formed by water accumulating behind a landslide (which is considered a stream and not a regulated wetland). There is also an open water regulated wetland (Onion Pond) at the southern portion of the training area; and an open water area in Kaunala Gulch at the southern portion of KTA. Other areas are dominated by California grass that supports some accumulation of water.

On KLOA there are three areas that are likely to be wetlands, but have not been verified; these include Peahinaia Pond, Lehua Makanoe Bog, and Poamoho Pond. The terrain in these areas is too steep and likely is not favorable to support military training.

At DMR, the California grass meadows are previously documented on the NWI map; however, each lacked the three necessary criteria required by the 1987 USACE Wetland Delineation Manual. Based on subsequent field visits and sampling points, it was determined that the perched, spring-fed wetland is the only site that meets all three USACE hydric indicators. The perched wetland may be subject to permitting by the USACE, which may in turn affect possible future development or on-going activities such as training. This, however, is unlikely due to its

isolated position on the slope of the mountain. Nonetheless, its conditions should be periodically monitored in the event plans are made that could potentially and negatively impact it.

There are no wetlands or jurisdictional waters of the U.S. within the boundaries of PTA, as the training area consists of extremely well drained soils. Therefore, wetlands at PTA are not discussed further in this section.

4.18.8.2 Environmental Consequences

No Action Alternative

Minor impacts to wetlands are anticipated under the No Action Alternative. Wetlands would be impacted through training, sedimentation, and construction to a minor extent each year. Very few regulated wetlands are present on USAG-HI, and impacts to wetlands from Army activities would not be anticipated. SOPs and BMPs designed to minimize impacts to wetlands and other waterbodies through stormwater and erosion control would continue to be followed for future construction projects. No wetlands have been identified at KLOA, and no live fire occurs at DMR, so no impacts to wetlands from live-fire training could occur at KLOA or DMR. On KTA, use of the Combined Arms Collective Training Facility (CACTF) range would take place more than 2 miles away from Onion Pond, a regulated wetland; therefore, no impacts to this wetland are anticipated to occur from training at the CACTF. SOPs and BMPs designed to minimize impacts to wetlands and non-regulated waterbodies through stormwater and erosion control would be followed.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Minor impacts are anticipated as result of the implementation of Alternative 1. Deconstruction of facilities could result in minor sedimentation into wetlands. The impacts would likely be negligible or minor because the USAG-HI has SWMPs in place to mitigate the effects of sediment transport. No new range construction would occur. In addition, none of the current ranges would be expanded. Therefore, no effects to wetlands are anticipated.

The number of required live-fire and maneuver training user days per year at USAG-HI would drop below current levels. Because the live-fire ranges were located to avoid significant wetland impacts, continued live-fire training is not anticipated to affect the function or presence of wetlands at USAG-HI. No new maneuver areas would be required and maneuver training would be conducted in the footprint of existing or previously approved ranges and trails at USAG-HI. Consequently, no change in impacts to wetlands from maneuver training is anticipated.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

No wetlands would be impacted by proposed cantonment construction at SBMR as wetlands areas are not near potential construction sites. Mitigation measures concerning stormwater runoff are already in place. No additional effects from soil or sediment transport are anticipated. There are no wetlands located at or near the South Range area where potential construction could occur.

Onion Pond (at KTA) is located more than 2 miles from where training may occur; additionally, live munitions are not used in this training area; therefore, no additional effects are anticipated. There are no wetlands in the vicinity of other live-fire areas located on O'ahu, therefore no effects are anticipated. Live-fire activity increases would occur on existing and previously planned live-fire training areas designated for live-fire use on SBMR and South Range.

Maneuver training at SBMR (Mount Kaala) is not projected to affect wetlands areas. A wetland delineation of DMR identified one jurisdictional wetland. This perched wetland is within DMR but outside of the area that would be used for maneuver training. An additional wetland area was also investigated at DMR. Based on an evaluation by the USACE, Honolulu District, Regulatory Branch, dated September 4, 2002, the wetland area was determined to be non-jurisdictional and not regulated under Section 404 of the CWA. Because the wetland is outside of the maneuver training area, impacts are anticipated to be minor. Sedimentation resulting from maneuver training could have impacts on less proximate wetlands outside of SBMR and other maneuver training sites, but given that there are no wetlands in close proximity to maneuver areas on O'ahu, this is unlikely. No impacts would occur at PTA as there are no jurisdictional wetlands. Overall, minor impacts would occur at USAG-HI sites on O'ahu and no impacts on PTA.

4.18.9 Water Resources

4.18.9.1 Affected Environment

Watersheds. The ROI for these stationing scenarios involves the housing of Soldiers and their equipment on the Island of O'ahu, and training at ranges on O'ahu and the Island of Hawai`i. Rainfall throughout the ROI is unevenly distributed and highly dependent on elevation. Above 3,000 feet above MSL both islands are relatively dry. The maximum amount of rainfall occurs at elevations between 2,000 and 3,000 feet above MSL. At SBMP, the average annual rainfall is between 43-45 inches per year. Comparatively, Wheeler Army Airfield has an average rainfall of 38 inches; SBER varies from 200 inches on the crest of Koolau Range to 40 inches near Wahiawa; at KTA and KLOA rainfall ranges from 40 to 50 inches near the coast to about 150 inches at the summit of the Koolau Mountains; and DMR ranges experience an average rainfall of 20 to 30 inches annually, however the amounts vary by elevation and time of year.

SBMR lies near the drainage divide between the Kaukonahua watershed and the Waikele watershed. The principal surface water feature of the Kaukonahua watershed is the Wahiawa Reservoir (Lake Wilson), which lies just outside the eastern boundary of SBMR, east of Highway 99. The reservoir stores drainage from tributaries of the Kaukonahua Stream that originate in the Koolau Range. The reservoir receives small amounts of surface drainage from the eastern side of SBMR and is used for agricultural irrigation. The main drainages at SBMR are the Waikoloa Gulch and the Waikele Stream. The Waikoloa Gulch drains the area just north of the cantonment and joins the Kaukonahua Stream below Wahiawa Reservoir. Two other streams that drain the north part of SBMR (Mohiakea Gulch and Haleanau Gulch) are tributaries to the Kaukonahua Stream. Kaukonahua Stream drains northward through the area underlain by the Waialua aquifer system, joining the Poamoho Stream to form the Kiikii Stream, which discharges to Kaiaka Bay just east of Waialua. Streams in lower reaches of SBMR tend to be intermittent because runoff from small storms is absorbed in bedrock fractures and never reaches the plateau. Runoff from larger or more intense storms overwhelms the capacity of these fracture systems and continues to flow onto the plateau. Waikele Stream, which originates in the Honouliuli Forest Preserve along the east slope of the Waianae Range south of SBMR, drains the south boundary of SBMR. It flows south along the west side of Wheeler Army Airfield, across land overlying the Waipahu-Waiawa aquifer system, and eventually discharges to the West Loch of Pearl Harbor.

Wheeler Army Airfield is bounded by SBMR, Wahiawa Reservoir, the Kamehameha Highway, and Waikele Stream. Surface drainage from Wheeler Army Airfield drains to Waikele Gulch. Runoff from the runway area is reportedly collected in a network of grated drains that drain to a 15-inch-diameter storm drain believed to discharge to Waikele Gulch.

SBER (for the most part) lies within the Kaukonahua watershed. The southern boundary of SBER lies on or near the topographic divide separating the Kaukonahua watershed from the Waikele watershed. Therefore, some surface water from SBER may drain to the Waikakalaua Stream, which ultimately drains south to the West Loch of Pearl Harbor. Most of SBER is drained by the South Fork of Kaukonahua Stream, which discharges to the Wahiawa Reservoir. The Kaukonahua Stream, downstream of Wahiawa Reservoir, ultimately discharges to Kaiaka Bay at Haleiwa. Kaukonahua Stream, at 33 miles, is the longest stream on O'ahu and the longest perennial stream. SBER extends to the crest of the Koolau Range, which has the highest rainfall on O'ahu. Thus, the east side of SBER is an important source region for surface water supplies. A number of reservoirs and surface water conveyances (ditches and tunnels) have been constructed along the Kaukonahua Stream drainage and its tributaries. The Ku Tree Reservoir is the largest of these water storage facilities.

The Poamoho watershed is drained by the Poamoho Stream and several smaller streams. The Upper Helemano Reservoir is east of the Helemano Trail and stores water for irrigation. The water is conveyed to farmland in the Poamoho watershed through a network of canals and ditches, some of which follow existing drainages.

The South Range area is drained by Waikele Stream and its tributaries and lies entirely within the portion of the watershed of Waikele Stream that is upstream of Wheeler Army Airfield. The tributaries to Waikele Stream are ephemeral and generally dry except during short periods following heavy rainfall.

KTA contains portions of four watersheds: Paumalu, Kawela, Oio, and Malaekahana watersheds. The Paumalu watershed in the west includes drainages from Paumalu Stream on the west to Waialee Gulch on the east. The headwaters of the Paumalu Stream are in the Pupukea Paumalu Forest Reserve, most of which is within the boundaries of KTA. KTA does not include the downstream portion of the Paumalu Stream, but most of the watershed east of the Paumalu drainage, almost to the Kamehameha Highway, is on KTA. To the east of Paumalu watershed is the Kawela watershed, which includes the streams that drain to Kawela Bay (Pahipahialua Stream and Kawela Stream). East of Paumalu and Kawela watersheds is the Oio watershed, which includes the upper portions of drainages from Oio Gulch east to Keaaulu Gulch, which discharges at the Town of Kahuku. Adjacent to the Oio watershed is the Malaekahana watershed, which consists of the upper drainage of Malaekahana Stream. The lower reaches of many of these streams have been diverted or captured for irrigation and flood control, but the upper reaches, on KTA, are generally the natural drainages. All streams and gulches on KTA are intermittent except for Malaekahana Stream, which is perennial.

Drum Road runs along the west slope of the Koolau Mountain Range and across the Schofield Plateau, from KTA, through KLOA to SBMR. Outside of KTA, Drum Road crosses several watersheds. Waimea watershed is drained by several streams including Kauwalu Gulch, Elehaha Stream, Kamananui Stream, and Kaiwikoele Stream. Kauwalu Gulch and Elehaha Stream are both intermittent, while Kamananui and Kaiwikoele Streams are both perennial. Elehaha and Kamananui Streams are tributaries of the Waimea River. Drum Road passes along the ridge that forms the boundary between the head of the Keamanea, Waimea, and Kawailoa watersheds, northwest of Puu Kapu where eventually the road crosses inside KLOA. West of Puu Kapu, it crosses Kawailoa watershed and then follows the ridge separating the Kawainui and Kawaiiki watersheds (on the east) from the Anahulu watershed (to the west). The Kawailoa watershed is a narrow east-west trending strip of land, north of Puu Kapu that does not have any surface outflow but probably drains below the surface to the adjacent watersheds. The Kawainui and Kawaiiki Streams (both perennial streams) are tributaries of the Anahulu River, which occupies the Kawailoa Gulch and discharges at Waialua Bay, north of Haleiwa. The junction of the two streams marks the head of the Anahulu watershed. The road follows the

boundary of the Kawaiiki watershed, then turns sharply west and continues along the ridge separating the Anahulu watershed and the Opaeula watershed. The Opaeula Reservoir is in the Anahulu watershed, but is recharged by diversions from the Kawaiiki and Opaeula streams via ditches or tunnels that cross the watershed boundaries. Southwest of the Opaeula Reservoir, Drum Road crosses the Opaeula watershed and the Opaeula Stream (a perennial stream) and then follows Twin Bridge Road west of Bryans Mountain House. This segment of the trail is on the boundary between the Opaeula watershed and the Helemano watershed.

The majority of DMR is located in the Kawaihapai watershed. The most extreme eastern portion of DMR is located in the Pahole Watershed. Dillingham Trail is located in the Kawaihapai, Pahole, and Makaleha watersheds. Several unnamed intermittent streams occur on the training area. DMR is on the north slope or at the foot of Kaala Mountain and the northwest-trending ridge of the Waianae Range. Most of the streams carry intermittent flows and are subject to short duration flash floods following rainfall events.

Rainfall is the primary source of groundwater recharge on Hawai'i Island; Hawai'i Island has the highest recharge rate among the Hawaiian Islands (USACE, 2008a). Rainfall, fog drip and occasional frost are the main sources of water for the biological resources found on PTA. PTA experiences an average rainfall of 10 to 16 inches annually.

Water Supply. Demand for water has been growing in the Ewa area of O'ahu, but the windward side of the island currently has sufficient supplies. Water is supplied to SBMR through pipelines; whereas, water must be trucked in to KTA and KLOA.

Potable water is supplied to SBMR and Wheeler Army Airfield by a well and water treatment facility located on SBER. This facility produces and treats 4.0 to 9.0 mgd. The State of Hawai`i Department of Land and Natural Resources permit allocates a 12-month moving average of 5.648 mgd to the Army from the groundwater aquifer. The average ranges from a low of 3.849 mgd in January to a high of 6.948 mgd in September.

Based on a demand factor of 1.3 per person and a domestic allowance of 150 gallons (568 liters) per capita per day, the domestic daily demand was estimated at 4.13 mgd in the 1993 Real Property Master Plan. The average estimated daily demand of Schofield Barracks was 3.059 mgd, as identified in the Real Property Master Plan (Belt Collins, 1993). Peak daily demands were estimated at 2.5 times the average.

There is no water infrastructure for the South Range area. At PTA, there is no water supply and all water must be trucked approximately 40 miles.

***Wastewater*.** Wastewater treatment in Hawai`i is accomplished by WWTPs and by underground injection control (UIC). Wastewater is conveyed from SBMR to the treatment plant at Wheeler Army Airfield using a gravity system. The Wheeler Army Airfield plant is a secondary treatment facility that was constructed in 1976 and has been upgraded to a capacity of 4.2 mgd. How much is used? The system does not have redundant backup, so continuous maintenance is required to avoid spills. The Army has recently upgraded the treatment level from secondary to advanced tertiary.

The Schofield Barracks WWTP has a design capacity of 4.2 mgd and processes an average daily flow of 2.6 mgd from the installation, Wheeler Army Airfield, and other nearby Army facilities.

PTA does not currently have any wastewater infrastructure (e.g., sewer system). In 2004, EPA Region IX required the conversion or removal of all large capacity cesspools. The Army complied with federal and state cesspool regulations by converting its large capacity cesspools to septic systems and utilizing UIC wells. Permits for UICs are issued by Hawai'i Department of

Health, Safe Drinking Water Branch. All wastewater at PTA is handled through a combination of portable latrines, septic tanks and/or UIC wells in accordance with Hawai'i Department of Health, Safe Drinking Water Branch, UIC permit UH-2609. Injectant from permit UH-2609 is limited to septic tank-treated domestic wastewater from five separate septic tank wastewater treatment systems at PTA. Under this permit, the state requires the Army to conduct daily monitoring, quarterly sampling, periodic inspections, and annual status reporting. On-site staff at PTA completes these regulatory requirements for submittal to Hawai'i Department of Health, Safe Drinking Water Branch.

Stormwater. According to Hawai`i's 1998 305(b) report, most of the state's waterbodies have variable water quality that declines when stormwater runoff carries pollutants into surface waters. The most significant surface water pollution problems in Hawai`i are siltation, turbidity, nutrients, organic enrichment, toxins, pathogens, and pH from nonpoint sources, including agriculture and urban runoff. Stormwater runoff from SBMR and O'ahu training sites may affect the waterways and drainage areas described under the subheading "Watersheds" above.

The vast majority of PTA consists of variable permeable surfaces that easily allow rain to infiltrate naturally. PTA has a SWMP in place.

4.18.9.2 Environmental Consequences

No Action Alternative

Water supply and wastewater facilities are adequate and only routine upgrades and maintenance would occur. USAG-HI has plenty of potable water to meet water demands to support its operations. SOPs and BMPs designed to minimize impacts to surface and groundwater through stormwater and erosion control would continue to be followed. No changes in maneuver or live fire would change impacts to surface or groundwater. Overall minor impacts would occur at SBMR and PTA.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Minor impacts are anticipated as a result of the implementation of Alternative 1. An increase in the FRP and facilities demolition at USAG-HI would occur as part of this scenario at SBMP and Fort Shafter. Older, less efficient facilities nearing the end of their life-cycle would be demolished when no longer needed to support Soldiers or their Families.

The number of Soldiers at SBMR would decrease by approximately 30 percent, and the existing water and wastewater infrastructure would not require modifications other than routine maintenance. Range and cantonment construction projects would proceed as they are planned. Standard construction BMPs would be followed to maintain less than significant impacts from runoff to surface and groundwater. Continued implementation of the ITAM and Operational Range Assessment programs would minimize impacts from live-fire and maneuver training and maintain them at a less than significant level.

Cantonment Construction. No additional cantonment construction is required in USAG-HI as a result of this alternative. With existing, on-going Army projects, the garrison has critical facilities available to support existing units' living, administrative, and vehicle maintenance requirements. Additionally, some construction renovation may occur at SBMR on as needed basis in the future. Water supply and wastewater facilities are adequate and only routine upgrades and maintenance would occur. SOPs and BMPs designed to minimize impacts to surface and groundwater through stormwater and erosion control would continue to be followed. No impacts would occur.

Range Infrastructure Construction. There is no difference in impacts from range infrastructure construction between the No Action Alternative and Alternative 1.

Live-Fire Training. There would be no change in the type of rounds used during live-fire training at O'ahu ranges. Nonetheless, training ranges have the potential to carry contamination resulting from decades of use. Contaminants associated with military activities include residues of explosives or other constituents of munitions such as metals, constituents of plastics, or combustion products. Other chemical pollutants, such as petroleum hydrocarbon fuels or lubricants, may be inadvertently spilled or released as an indirect result of military activities. To better understand the potential impacts from this, the Army has started an assessment of offsite potential for contaminants at Schofield Barracks under the Operational Range Assessment Program. Preliminary results show no contamination of surface water by explosive residues, and less than significant impacts are anticipated to continue under the reduction alternative.

Maneuver Training. Maneuver training would continue to occur at SBMR, DMR, and KTA. Maneuver training would remain a combination of on-road and off-road areas on O'ahu. The same number or fewer MIMs would be executed at designated maneuver training areas. Maneuver training could involve the possibility of accidental spills of petroleum products (from fuel or hydraulic lines) or other chemicals. Maneuver training would continue to cause sedimentation and turbidity in waterbodies, a potential significant impact. Continued implementation of the ITAM and Operational Range Assessment programs would minimize these impacts and maintain them at a less than significant level.

Overall impacts as a result of this alternative would be minor at USAG-HI sites on O'ahu and at PTA.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

At SBMR, the addition of Soldiers would require the addition of water transport lines to support cantonment construction. An additional 1-million-gallon potable water storage tank would be needed to support the additional Soldiers and their Families.

The current wastewater collection system at the installation would require additional upgrades in order to accommodate the additional flow (upgrades may include new sewer lines or extensions to existing lines). In order to determine the scope of any upgrades, the installation project manager for design would need to conduct modeling of the collection system. DPW Utilities Wastewater Manager and/or Aqua Engineers would review the modeling information and approve the results.

The WWTP at Schofield Barracks would require a minor upgrade to support the increase in 1,500 Soldiers if the Soldiers' Families are housed off post, and this is identified as a mitigation measure; The addition of the 1,500 Soldiers' Families on post would require a major WWTP upgrade. The addition of housing and the WWTP would be subject to additional NEPA analysis.

Lake Wilson and all nearby waterbodies may experience impacts from construction due to stormwater runoff (effects would include an increase in turbidity); however, these effects may be temporary and should prove mitigable. All work in gullies would require Army 404, State Department of Health, 401 (clean water) and NPDES permits if work were to be conducted at or near existing waterways. Any roadway construction or improvement may require provisions for stormwater drainage and/or detention basins to handle run-off from built or paved areas. Pesticides existing in soils at South Range may impact nearby waterbodies during construction due to stormwater runoff. Implementation of BMPs and mitigations to minimize runoff from construction sites would be required. Due to its location, stormwater runoff from South Range has the potential to affect waterways outside the installation boundary and on Wheeler Army Airfield. As TMDLs are developed by the state for impaired waterbodies, it is likely that USAG-

HI would receive a waste load allocation and would need to develop additional BMPs to reduce pollutant loads in stormwater discharges

Long-term minor effects may occur due to water consumption. As indicated above, the water treatment facility supplying potable water to SBMR and Wheeler Army Airfield is currently operating below capacity. There would be adequate potable water capacity to accommodate growth under Alternative 2.

During ground preparation for new construction sites, grading, excavating, and trenching may expose erodible soils to stormwater runoff and increase the potential for sediments to contaminate surface waters. Similarly, broken hydraulic lines on heavy equipment could spill chemicals during equipment refueling, and chemical solvents, paints, and other chemicals used in construction could also be spilled. These potential impacts would be reduced to acceptable levels by implementing standard construction BMPs.

Chemicals, such as petroleum hydrocarbons that may spill or leak onto soils as a result of vehicle use or refueling, could be bound to soil particles and then transported to surface water by erosion. These impacts are anticipated to be less than significant because spills would be addressed effectively through standard procedures.

The added live-fire training would increase lead and other materials on ranges. Runoff from impacted berms and disrupted soils is possible as the added live-fire activity may increase sediment transported to streams draining the ranges, and ultimately to surface waters beyond the installation boundary. In the absence of mitigation, an increase in sediment erosion could result in greater impacts, possibly in exceedances of health-based standards or antidegradation policy goals. The Army has started an assessment of offsite potential for contaminants at Schofield Barracks under the Operational Range Assessment Program. Samples of surface soils from selected areas on the training ranges were collected and analyzed, and these data provide an indication of the concentrations of metals, semi-VOCs, and explosive material in surface soils that could be transported to surface water. While still in the early stages of the assessment, preliminary results show no contamination of surface water. Installation DPW staff monitors impacts from live-fire activities and would continue to institute the required mitigations and BMPs (such as berm revegetation and regrading) to minimize effects off the firing ranges. Other chemical pollutants, such as petroleum hydrocarbon fuels or lubricants, may indirectly affect water quality resulting from vehicles parked at the training sites.

The risk of wildland fires is anticipated to remain at about the same level as under existing conditions or slightly higher due to the increase in live-fire activity associated with Combat Support stationing scenarios. The potential for wildland fires is anticipated to be low but could increase when the land is fallowed due to growth of grasses and other vegetation. Wildland fires can generate chemical contaminants and loss of vegetation can increase the potential for soil erosion and sediment loading to streams. Either of these effects could result in adverse impacts on water quality.

Additional maneuver traffic on the range road network and stream crossings (at KTA, SBER, or KLOA) during maneuvers may contribute to increased sedimentation and turbidity in waterbodies. Off-road maneuvers of Combat Support units would be projected to account for a larger increase in off-road sedimentation impacts to surface waters, resultant from a loss of vegetative cover and associated loss of soils carried to surface water by wind and water erosion. No new type of maneuver or maneuver land use is being proposed for USAG-HI training areas. All uses would be increases to existing maneuver land use anticipated to increase up to 10 to 15 percent of USAG-HI total maneuver training load at maneuver training areas on O'ahu and at PTA.

Efforts to reinforce stream crossings or monitor those areas for decreased water quality may also be considered. Further, bivouac sites in the training area may also need to be monitored and maintained more closely to ensure against stormwater runoff that may stem from the effects of increased Soldier throughput in those areas.

Minor impacts would occur to wastewater and stormwater at DMR. The amount of additional training there may not be substantial and would be supported by existing facilities. These areas were to be improved to accommodate training from the 2/25th SBCT; these include drainage improvements, culverts at stream crossings, grass and concrete swales, and drainage structures and lines to manage stormwater runoff.

Regulatory and Administrative Measure 1. Implementing Phase II Stormwater Management Regulations of the CWA, ITAM and construction BMPs would reduce nonpoint source contamination of surface water to less than significant.

Regulatory and Administrative Measure 2. The Army continually funds and implements USAG-HI-wide land management practices and procedures described in the ITAM annual work plan to reduce erosion and other soil and geologic impacts. Currently, these measures include implementing a Training Requirements Integration program, implementing an ITAM program, implementing a Sustainable Range Awareness program, developing and enforcing range regulations, and continuing to implement land rehabilitation projects, as needed, within the LRAM program. Examples of erosion and sediment control measures identified in the ITAM annual work plan include stormwater runoff control structures (silt fences, hay bales, etc.) as part of standard BMPs, which would divert water from the construction sites. Standard range maintenance BMPs implemented by USAG-HI include road grading, target repair, and berm recontouring. Examples of current LRAM activities at USAG-HI include revegetation projects involving site preparation, liming, fertilization, seeding or hydroseeding, tree planting, irrigation, and mulching; combat trail maintenance program, coordination through the TCCC on road maintenance projects; and development mapping and GIS tools for identifying and tracking progress of mitigation measures. These mitigation measures would reduce loss of vegetation and biological soil components associated with maneuver training.

Overall impacts to water resources would be significant but mitigable at SBMR and O'ahu training sites, and less than significant at PTA.

4.18.10 Facilities

4.18.10.1 Affected Environment

To manage land, facilities, and infrastructure, USAG-HI has prepared a Real Property Master Plan. AR 210-10, Real Property Master Planning, guides USAG-HI's real property planning process. Family housing, barracks, offices, roads, recreational areas, live-fire ranges, and maneuver areas are all real property assets occupying Army lands. USAG-HI currently has the housing (on and off post), ranges and training facilities to accommodate its Soldiers and their Families.

4.18.10.2 Environmental Consequences

No Action Alternative

Impacts to facilities would be minor under the No Action Alternative because USAG-HI currently has adequate facilities available to support its Soldiers, Families, and missions. The installation would continue to implement the Army's FRP at USAG-HI. Environmental analyses of the projects that result from these programs are conducted prior to implementation of facilities deconstruction.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Beneficial impacts are anticipated as a result of the implementation of Alternative 1. An increase in the FRP and facilities demolition at USAG-HI would occur as a result of this scenario. Older, less efficient facilities nearing the end of their life-cycle would be demolished when no longer needed to support Soldiers or their Families to reduce maintenance and energy requirements. Facility usage and availability for the remaining population would not be affected. Minor long-term effects are anticipated as a result of required building demolition, solid waste disposal, and site recapitalization, and the repurposing of existing facilities to accommodate different Army needs as a result of force reduction. A reduction scenario would not result in the alteration or relocation of existing utility systems or expansion of existing installation facilities. A reduction in troop strength would impact the local housing community, on-post support services, the barracks program, and associated Army civilian staffing requirements. A reduction by 8,000 Soldiers would reduce MILCON requirements, reduce the strain on utility/infrastructure systems, and result in less traffic and parking issues across the installation. Any reduction of troops to the installation would result in more facilities being available to remaining Units, less traffic, and less congestion at ACPs and potential for more open and green space.

Beneficial impacts are anticipated as a result of the implementation of Alternative 1. An increase in the FRP and facilities demolition at USAG-HI would occur as a result of this scenario. Older, less efficient facilities nearing the end of their life-cycle would be demolished when no longer needed to support Soldiers or their Families to save the Army on maintenance and energy requirements. Facility usage and availability for the remaining population would not be affected. Minor long-term effects are anticipated as a result of required building demolition, solid waste disposal, and site recapitalization, and the repurposing of existing facilities to accommodate different Army needs as part of force reduction. A reduction scenario would not result in the alteration or relocation of existing utility systems or expansion of existing installation facilities. A reduction in troop strength would impact on-post support services and associated Army civilian staffing requirements. A reduction by 8,000 Soldiers would significantly reduce MILCON requirements and create an overall cost savings of $849 million to the Army MILCON program. Future projects that would not be required include Barracks PN76586 ($41 million), PN76587 ($55 million) PN76903 ($85 million); Company Operations Facilities (COF's) PN76583 ($90 million), PN76584 ($90 million); Brigade and Battalion Headquarters PN31311 ($61 million), PN67176 ($89 million); Tactical Equipment Maintenance Facilities PN52582 ($84 million), PN76591 ($31 million), PN76580 ($67 million), PN76581 ($64 million); and Parking Structures PN60058 ($37 million), PN60057 ($26 million), PN31311 ($29 million). There would no longer be the requirement for 23 relocatable trailers at Hamilton, Martinez, and Duck Fields that are currently being used as interim administrative space for Soldiers awaiting the award and construction of COF and BOF MILCON projects. Additional benefits include reduced strain on utility/infrastructure systems resulting in less traffic and parking issues across the installation. The reduction of 8,000 Soldiers and Army civilians would also reduce water usage by approximately 700,000 gpd, and automobile fuel consumption would be reduced by 14,560,000 gallons/year saving the precious natural resources on the island. Any reduction of troops to the installation would result in more facilities being available to remaining Units, less traffic, and less congestion at ACPs and potential for more open and green space.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Since 2004 Hawai'i has had at least one Brigade deployed almost continuously. During this timeframe, despite the reduced population, Schofield Barracks has experienced base-crowding issues with insufficient parking, crowded roadways, failed or failing utility systems, inadequate ACPs and other issues inherent with high density population. SBMR would need a substantial amount of MILCON projects and conduct considerable facilities upgrades to accommodate an additional 1,500 Soldiers and their Families.

The use of Army facilities would continue as they are currently designed. Demand for public services may increase slightly from existing levels. Ranges would degrade with continued use, but impacts would be less than significant as the ranges would be repaired and maintained. Construction of facilities at SBMR would occur as infill (built among existing structures and infrastructure) with demolition of existing facilities in the cantonment area. In addition, new infrastructure, utility lines, sewage lines and water lines would need to be built to support construction of garrison facilities to support Units as a result of this stationing scenario in Hawai'i.

The Army in Hawai'i is still building facilities to accommodate recent growth. Alternative 2 would require a large investment in military construction funds for facilities, utilities, and ACP. There would be a significant adverse impact unless the projects necessary to support Alternative 2 are funded.

Cantonment Construction. In 2004, the Army transformed to a Modular Force structure; however, numerous MILCON projects are still required to support the transformation to a modular force in Hawai'i. The programmed MILCONs address only barracks requirements but do not address motor pools, operational facilities, infrastructure, traffic or ACP upgrades required across the installations to support any added population. Facilities and infrastructure projects must be provided to support installation operations. Without these projects, significant impacts would result. These projects and facilities are identified as mitigation necessary to reduce impacts to less-than-significant.

Overall impacts to facilities as a result of the implementation of Alternative 2 would be significant but mitigable with the construction of additional facilities.

Range Infrastructure Construction. Range maintenance projects on existing ranges would proceed as needed. Maintenance projects would not add new facilities to the inventory of facilities on O'ahu. These projects would slightly increase the demand for utilities and public services. The overall effects of the range construction projects would be less than significant.

Live-Fire Training. Use of live-fire training areas would continue at ranges currently available. On-going use of live-fire training areas would continue to degrade these facilities. With continued implementation of regulatory and administrative mitigation such as ITAM, INRMPs, ecosystem management, and the sustainable range management program, impacts to facilities may still increase. There would be less down time and increased throughput until maximum capacity is reached. Impacts are anticipated to be significant.

Maneuver Training. Use of maneuver training areas would continue at maneuver areas currently available for maneuver use. On-going use of maneuver training areas would continue to degrade these facilities. However, with continued implementation of regulatory and administrative mitigation such as ITAM, INRMPs, ecosystem management, and the sustainable range management program, impacts to facilities are anticipated to be less than significant.

Overall impacts to facilities from the implementation of Alternative 2 would be significant, but mitigable by necessary construction at SBMR and O'ahu training sites and less than significant at PTA.

4.18.11 Socioeconomics

4.18.11.1 Affected Environment

Schofield Barracks is located in the central part of the Island of O'ahu, near to the Town of Wahiawa. It is a census-designated place in the City and County of Honolulu and in the Wahiawa District. The ROI associated with the Proposed Action includes the County of Honolulu, located on O'ahu where Schofield Barracks and its designated training areas (South Range, East Range, KTA, and KLOA) are located. This is where a vast majority of Soldiers and Army civilians reside and is where economic impacts associated with the Proposed Action would occur. Honolulu County covers the entire Island of O'ahu. Honolulu County is further divided into seven Census County Divisions (CCDs) which are Ewa, Honolulu, Koolauloa, Koolaupoko, Wahaiwa, Waialua, and Waianae; each is a permanent statistical area established cooperatively by the state and local governments with the U.S. Census Bureau. KTA is located within the Koolauloa CCD; DMR resides within the Waialua CCD; and Schofield Barracks resides within the Wahiawa CCD.

Population and Demographics. The Schofield Barracks population is measured in three different ways. The daily working population is 18,441, and consists of Soldiers and Army civilians working on post. The population that lives on Schofield Barracks consists of 11,806 Soldiers and 25,993 dependents, for a total on-post resident population of 37,799. Finally, the portion of the ROI population related to Schofield Barracks is 16,720 and consists of Soldiers, civilian employees, and their dependents living off post.

The ROI population is 953,000. The 2010 population increased 8.8 percent over the year 2000.

The racial and ethnic percentage composition of the ROI population is Caucasians 19, African Americans 2, Hispanics 8, Asians 43, Native American 0, Multiracial 19, and Other Groups 9, respectively. This is comparable to the state composition.

The population surrounding DMR represented approximately 1.5 percent of the population of Honolulu County, and by the year 2009 decreased to an estimated 13,812 residents (from 14,027 residents in 2000). Approximately 62 percent of the area (Waialua CCD) is made up of minority ethnic groups, the largest percent of which is Asian/Pacific Islander (30.9 percent of the population). No military or civilian personnel are permanently stationed or reside at DMR.

For KTA, the population within the Koolauloa CCD represents approximately 2.1 percent of Honolulu County. In 2009, nearly 18,923 residents resided in this region. Approximately 63 percent of the population was comprised of minority ethnic groups, the largest percent of which is Asian/Pacific Islander (35.0 percent of the population). No military or civilian personnel are permanently stationed or reside at KTA.

For KLOA, the population is made up of the demographics described for the Waialua and Koolauloa CCDs (as previously described). No military or civilian personnel are permanently stationed or reside at KLOA.

Soldiers home-stationed at SBMR live on post or live in off-post housing, within commuting distance from the installation. Due to the size of O'ahu (approximately 44 miles long and 30 miles wide) Soldiers stationed at Schofield Barracks may reside off post virtually anywhere on O'ahu; therefore, stationing new units on O'ahu has the potential to influence school enrollment throughout the Island of O'ahu.

Employment and Income. From 2000, the 2009 employment (private nonfarm) increased by 7.20 percent in Honolulu County and state employment increased by 13.01 percent. The overall private nonfarm employment total for Honolulu County in 2009 was 338,594. Overall private nonfarm employment for the State of Hawai'i in 2009 was 488,403. The 2005-2009 median home value was $537,800 in Honolulu County, and the state median value was $521,500. The 2009 median household income was $67,019 in Honolulu County, and state median income was $63,741. Based on 2009 data, the percent of the population below the poverty level was 9.70 percent for Honolulu County; the state poverty level was 10.40 percent. The unemployment rate in Honolulu County was 5.6 percent at the end of 2011, which is below the state average. The total number of housing units on the island is 334,469; of those 133,659 are renter occupied (2009).

Housing. USAG-HI can accommodate approximately 40 percent of the permanent party Soldier population with dependents assigned to the installations. There are currently 7,437 homes on USAG-HI installations that are managed through an RCI partnership that has been in place since 2005. Occupancy for on-post housing averages 99 percent annually and the waiting list exceeds 1,000 service members. Under RCI, the initial development period will result in an end state of homes of 7,756 in the year 2020. Unaccompanied Personnel Housing on USAG-HI installations consist of 6,720 spaces in 60 buildings located on five installations. Overall occupancy rate without deployments is 95 percent. Off-post housing consists primarily of high rise condominiums, multi-family dwellings, duplexes, and single homes. While there is an adequate supply of one and two bedroom apartments/condominiums available in the local economy, there is a shortfall of affordable three, four, and five bedroom homes as identified in the 2008 HMA for O'ahu. Forty percent of Soldiers with dependents are housed in Family housing on post while 60 percent reside in the surrounding civilian community (ROI), mostly in rental units. Ninety-five percent of unaccompanied Soldiers, E-5 and below, will be housed in barracks on post. Single Soldiers in the grade of E-6 and above are authorized to reside off post.

Schools. Unlike many states, Hawai'i is made up of one school district, which makes the island one of the 10 largest school districts in the U.S. There is only one State Superintendent who administers issues pertaining to the education of 170,000 students. Because the Army installations belong to this one large district, overcrowded conditions at on-post schools have caused some concerns. The classroom size is large and some of the base's students have to be transported to the neighboring schools. Other problems that must be addressed include overcrowded CYSS facilities, lack of funding for school transportation, the effect on extracurricular activities, and the possibility of a new school on base. Currently, the five base schools have the following enrollments: Hale Kula Elementary (1,000), Solomon Elementary (1,000), Wheeler Elementary (675), Shafter Elementary (375), and Wheeler Middle (900). The addition or subtraction of troops and their children are of concern.

Public Health and Safety.

- **Police and Security Services.** The USAG-HI Directorate of Emergency Services (DES) oversees police operations, physical security, access control, and wildland fire and emergency services. The City and County of Honolulu Police Department also provide law enforcement services since there is concurrent jurisdiction on all USAG-HI installations. However, the majority of law enforcement activities on post are provided by DES.
- **Fire and Emergency Services.** The Federal Fire Department (U.S. Navy) manages the installation structural fire program. The Federal Fire Department responds to emergencies involving structures, facilities, transportation equipment, hazardous

materials, and natural and man-made disasters, and directs fire prevention activities; and conducts public education programs. The Federal Fire Department has mutual aid agreements with the City and County of Honolulu.

- **Medical Facilities.** USAG-HI on-post medical services are administered at the installation clinics. This facility services all permanent party, Active Duty personnel and their dependents, as well as retirees and their dependents, within a 20-mile radius of the post. The Schofield Barracks Health Clinic functions as an outpatient treatment facility only. Acute care, specialty services, and long-term medical needs for military Families on O'ahu are provided by the Tripler Army Medical Center next to Fort Shafter.

4.18.11.2 Environmental Consequences

No Action Alternative

There would be no change or minor impacts anticipated from the No Action Alternative. This alternative would be anticipated to provide a steady-state contribution of economic and social benefits and costs. No additional impacts to housing, public and social services, public schools, public safety, or recreational activities is anticipated.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Economic Impacts. Alternative 1 would result in the loss of up to 8,000 military employees (Soldiers and Army civilians), each with an average annual income of $41,830. In addition, this alternative would affect an estimated 4,464 spouses and 7,680 dependent children, for a total estimated potential impact to 12,144 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 20,144 military employees and their dependents.

Based on the EIFS analysis, there would be significant socioeconomic impacts for population and employment in the ROI for this alternative. There would be no significant impacts for sales volume or income. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.18-6. Table 4.18-7 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.18-6. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	11.96	10.83	3.64	3.50
Economic Contraction Significance Value	- 4.16	- 4.04	- 1.78	- 0.94
Forecast Value	- 1.38	- 1.99	- 2.89	- 2.03

Table 4.18-7. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	- $458,189,100	- $390,949,300	- 8,831 (Direct) - 1,496 (Indirect) - 10,327 (Total)	- 20,144
Percent	- 1.38 (Annual Sales)	- 1.99	- 2.89	- 2.11

The total annual loss in volume from direct and secondary sales in the ROI represents an estimated -1.38 percent change in total sales volume from the current sales volume of $33.18 billion within the ROI. State tax revenues would decrease by approximately $18.32 million as a result of the loss in revenue from sales reductions. Some counties within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be lost at the county and local level. Regional income would decrease by 1.99 percent. While 8,000 Army Soldier and government civilian positions would be lost within the ROI, EIFS estimates another 831 military contract service jobs would be lost, and an additional 1,496 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 10,327 jobs, or a -2.89 percent change in regional non-farm employment. The total number of employed positions (non-farm) in the ROI is estimated to be 357,035. A significant population reduction of 2.11 percent within the ROI is anticipated as a result of this alternative. Of the approximately 953,000 people (including those residing on Schofield Barracks) that live within the ROI, 20,144 military employees and their dependents would no longer reside in the area following the implementation of Alternative 1. This would lead to a decrease in demand for housing, and increased housing availability in the region. This could lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes civilian and military employees and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.18-8 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.18-8. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $365,808,847 (Local) - $529,922,482 (State)	- $406,640,553	- 9,037 (Direct) -1,152 (Indirect) - 10,189 (Total)
Percent	- 1.10 (Total Regional)	- 2.07	- 2.85

The total annual loss of direct and indirect sales in the ROI represents an estimated -1.10 percent change sales volume according to the RECONS model, an impact that is 0.28 percentage point less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would decrease by approximately $21.2 million as a result of the loss in revenue from sales reductions, which would be $2.88 million more in lost state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to decrease by 2.07 percent, slightly more than the 1.99 percent reduction projected by EIFS. While 8,000 Army Soldier and government civilian positions would be lost within the ROI as a direct result of the implementation of Alternative 1, RECONS estimates another 1,037 military contract and service jobs would be lost, and an additional 1,152 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the

ROI is projected to lead to a loss of 10,189 jobs, or a -2.85 percent change in regional non-farm employment, which would be 0.04 percentage points less than projected by the EIFS model.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 1 would lead to a net reduction of economic activity within the ROI of roughly the same order of magnitude.

Housing. Force reduction (up to 8,000 Soldiers and Army civilians) would not significantly impact the RCI program. With over 1,000 Families on the wait list and over 9,000 Families residing off post, occupancy of the on-post Family housing inventory would be maintained. RCI also maintains a waterfall priority for assignment to Family housing. If there are not any Soldiers with dependents on the waiting list, they will open up eligibility to other service members assigned to other installations, retirees, and DoD civilians. This option would impact the local housing market by the potential opening of up to 8,000 rentals and home purchases. The total number of households in Hawai'i is 437,976 (2011) with 183,562 (41.9 percent) being renter households. Alternative 1 would have a beneficial impact on renters but a negative impact on landlords in the ROI.

Schools. The loss of 8,000 Soldiers would lower school enrollment. This would result in the need for fewer teachers, staff, and administrators. In addition, some civilian jobs on installations would be in jeopardy. Major impacts on extracurricular activities would occur with less students. School closures could become a reality, the CYSS programs would suffer major losses, and off-post private schools would experience impacts. Facility and staff adjustments would have to be made to avoid significant negative impacts.

Public Health and Safety. As a result of the implementation of Alternative 1, resident and daytime population levels at USAG-HI would likely decrease and could potentially reduce demand on law enforcement, fire and emergency service providers, and medical care providers on and off post. Remaining Soldiers and their Family members would continue to need these services. USAG-HI anticipates a beneficial impact due to this alternative unless the reduction of Soldiers included military police and/or medical care providers which would reduce the number of Soldiers able to provide those specialized services for the remaining community members. In that scenario, the impact would be negative, but less than significant.

Environmental Justice. As a result of the implementation of Alternative 1, USAG-HI does not anticipate that a disproportionate adverse impact to minorities, economically disadvantaged populations or children would occur in the ROI. USAG-HI anticipates that job loss would be felt across economic sectors at all income levels and spread geographically throughout the ROI.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Economic Impacts. Alternative 2 would result in the increase of up to 1,500 Soldiers, each with an average annual income of $41,830. In addition, this alternative would affect an estimated 837 spouses and 1,440 dependent children, for a total estimated potential impact to 2,277 dependents. The total population of Soldiers and their dependents gained as a result of Alternative 2 is estimated to be 3,777.

Based on the EIFS analysis, there would be no significant impacts for sales volume, income, employment, or population. The range of values that would represent a significant economic impact in accordance with the EIFS model are presented in Table 4.18-9. Table 4.18-10 presents the projected economic impacts to the region for Alternative 2 as assessed by the Army's EIFS model.

Table 4.18-9. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 2

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	11.96	10.83	3.64	3.50
Economic Contraction Significance Value	- 4.16	- 4.04	- 1.78	- 0.94
Forecast Value	0.26	0.37	0.68	0.38

Table 4.18-10. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$85,910,160	$73,302,990	2,156 (Direct) 280 (Indirect) 2,436 (Total)	3,777
Percent	0.26 (Annual Sales)	0.37	0.68	0.38

The total annual gain in direct and indirect sales in the ROI represents an estimated 0.26 percent change in the total sales volume of $33.18 billion within the ROI. It is estimated that state tax revenues would increase by approximately $3.4 million as a result of the gain in revenue from sales increases. Some counties within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be gained at the county and local level. Regional income would increase by 0.37 percent. While 1,500 Soldiers would be gained within the ROI, EIFS estimates another 656 military contract service jobs would be gained, and an additional 280 jobs gained as a result of increased demand for goods and services in the ROI. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 2,436 jobs, or a 0.68 percent change in regional employment. The total number of employed positions (non-farming) within the ROI is estimated to be 357,035. A population increase of 0.38 percent within the ROI is anticipated as a result of this alternative. Of the approximately 990,000 people (including those residing on Schofield Barracks) that live within the ROI, 3,777 military employees and their dependents would begin to reside in the area following the implementation of Alternative 2. This would lead to an increase in demand for housing, and decreased housing availability in the region. This could lead to a slight increase in median home values. It should be noted that this estimate of population increase includes civilian and military employees and their dependents.

Table 4.18-11 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 2.

Table 4.18-11. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Rational Threshold Value	Sales Volume	Income	Employment
Total	$68,589,159 (Local) $99,360,465 (State)	$76,245,103	2,194 (Direct) 216 (Indirect) 2,411 (Total)
Percent	0.20 (Total Regional)	0.39	0.68

The total annual gain from direct and indirect sales in the region represents an estimated 0.20 percent change in total regional sales volume according to the RECONS model, an impact that is 0.06 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would increase by approximately $4 million as a result of the gain in revenue from sales reductions, which would be $600,000 more in additional state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to increase by 0.39 percent, slightly more than the 0.37 percent increase projected by EIFS. While 1,500 direct Soldiers would be gained within the ROI, RECONS estimates another 694 military contract and service jobs would be gained, and an additional 216 jobs would be created indirectly from increases in demand for goods and services in the ROI as a result of force increase. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 2,411 jobs, or a 0.68 percent change in regional non-farm employment, which would be equivalent to the employment increase projected by the EIFS model.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 2 would lead to a net increase of economic activity within the ROI. The beneficial impacts anticipated are roughly the same order of magnitude.

Housing. Any increase in housing requirements would have to be satisfied by the local economy until MILCON could support the building of additional Unaccompanied Personnel Housing/barracks for single Soldiers. The local economy would also be the source of housing for accompanied Soldiers until a new HMA to determine if additional on-post Family housing is required. Alternative 2 would have a significant effect on the rental market.

Schools. An additional 1,500 Soldiers and their Family members would cause more overcrowding in schools; bus transportation would be inadequate; classes would be larger; a need for more teachers and staff would occur; more cafeteria space would arise; the need for a new school facility becomes more imminent; more services from mental health personnel, nurses, monitors etc. would emerge; and a definite rise in safety concerns would need to be addressed. Alternative 2 would have a significant but mitigable impact if negotiations with the Hawai'i Department of Education to build a new elementary school on Schofield Barracks were to be successful.

Public Health and Safety. As a result of the implementation of Alternative 2, resident and daytime population levels on USAG-HI would increase and would subsequently increase the demand on law enforcement, fire and emergency service providers, and medical care providers on and off post. USAG-HI anticipates a significant impact as a result of Alternative 2. This increase in personnel would likely lead to greater traffic congestion, parking congestion, and an increase in crime given a higher residential and daytime population on post. This could be mitigated by a proportional increase in service providers and related facilities.

Environmental Justice. As a result of the implementation of Alternative 2, USAG-HI does not anticipate that a disproportionate adverse impact to minorities, economically disadvantaged populations or children would occur in the ROI.

4.18.12 Energy Demand and Generation

4.18.12.1 Affected Environment

Electrical power to O'ahu is supplied from the Hawaiian Electric and Light Company (HECO). Power supplies are described as adequate for both locations. Both of the islands are self-sufficient and provide an independent electrical generation supply (i.e., do not import or export

power to other islands). Increases in population and tourism have resulted in an escalating demand for each island's existing power supply. To meet rising demand and future demands HECO has added more than 100 MW of power generation in the last 3 years. In addition, multiple renewable energy projects have added additional capacity on O'ahu.

Schofield Barracks is presently serviced by two substations, Castner and Menoher substations, that support the distribution of power across the installation; both are provided energy from HECO 46 kV circuits. One of these lines presently runs through the South Range. The USAG-HI continues efforts to reduce power demand by implementing energy conservation methods, including promoting the use of energy efficient lighting, buildings, and examining new sources of renewable energy production to meet the installations energy requirements. Within the housing areas, IPC has installed nearly 1,200 PV systems with a installed capacity of approximately 5.2 MW.

PTA's electrical energy is provided by the HELCO from a HELCO-owned substation located outside the northeast fence of the cantonment area to the main base substation. At the substation, the 69-kV transmission voltage is transformed down to the 12.47-kV primary distribution voltage through a radial distribution system feeding the remainder of the installation, using a 2,500-kVA transformer. The base owns, operates, and maintains the distribution network beyond the substation; the components of this system include metering equipment, 29 transformers, 20 miles of overhead lines, and 755 poles. PTA's current electricity usage is approximately 1,718,400 kWh per year, and electricity consumption has increased steadily in recent years.

Although alternative sources of energy, such as using photo-voltaic cells to power the lights on the Bradshaw Army Airfield airstrip, have been tried at PTA to reduce overall energy usage, these systems have not yet been successful at PTA. PTA was nominated by Army officials in 2010 to be a prototype installation for a net zero energy assessment and planning. As part of this process, a study was conducted by the National Renewable Energy Laboratory to evaluate the potential for increasing energy efficiency and increasing the use of renewable sources of energy. While not ultimately selected as the prototype installation, the Army is using the information gained by conducting the National Renewable Energy Laboratory study to seek energy and environmental sustainability opportunities at PTA for both range and cantonment areas, including waste to energy projects, renewable energy, water conservation, waste minimization and management.

PTA was also recently awarded funding under the American Recovery and Reinvestment Act for the installation of two additional solar systems. The likely locations for the systems are on the HQ building and the fire station.

4.18.12.2 Environmental Consequences

No Action Alternative

This alternative would result in negligible effects to existing energy demand and utilization by USAG-HI. USAG-HI would continue to look for ways to reduce energy use and increase energy efficiency under the No Action Alternative. Energy demand through the use of Army facilities would continue and not change from existing levels. As the energy demands for O'ahu and PTA cantonment and training ranges is currently adequate, impacts from their use at present levels would be less than significant.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Long-term beneficial impacts to the power generation system would result from the proposed force reduction because there would be less strain and wear to the system. Decreases

associated with demand on the power plant, energy distribution lines, and infrastructure would result. The overall influence of the force reduction is anticipated to result in a decrease of regional power demand. Less energy resources, including coal and fuel, would be consumed.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

USAG-HI would experience minor impacts from the additional Soldiers and Family members. The installation's current energy infrastructure would be able to accommodate the addition of 1,500 Soldiers and their Family members. An increase in population associated with a stationing scenario would increase demand on the power plant, energy distribution lines, and infrastructure. The increase in Army Soldiers and Families is anticipated to increase power demand in the region, but additional power supply is being generated by HECO to accommodate regional population growth. There may be additional long-term energy demand in training areas; however, demand is anticipated to be slight and inconsequential compared to system capacity.

Maneuver training would increase as a result of this alternative; however, impacts to energy use and costs are anticipated to be minor. During maneuver training units power generation is typically self-contained (generators) and does not tap into existing power infrastructure. Overall increase in demand is anticipated to have minor impacts within USAG-HI.

4.18.13 Land Use Conflict and Compatibility

4.18.13.1 Affected Environment

Although federal land uses are not subject to state and County regulation, this section identifies possible conflicts between the Proposed Action and other federal, regional, state and local land use plans, policies and controls (40 CFR Part 1502.16(c)). The descriptions of existing land uses in this section use the State Land Use District designations: Conservation, Agriculture, Urban, or Rural. Conservation District Subzone designations, regulated by Hawai'i Department of Land and Natural Resources, are Protective, Limited, Resource, General, and Special. The state designations for Agricultural Lands of Importance to the State of Hawai`i categorize agricultural land as Prime, Unique, or other. In addition, this section also uses the Army classifications.

A range of recreational activities is available on lands within the ROI including surfing, hunting, fishing, mountain biking, and visiting national monuments. Additional recreational opportunities are available on some of the lands adjacent to or near the Army installations. Existing land uses and recreational opportunities are summarized in the following subsections for each of the Army installations within the ROI and surrounding lands.

Soldier and Family housing and other support facilities are located (or planned) at SBMR and South Range, SBER, and Wheeler Army Airfield; no Soldiers are permanently stationed at KTA, DMR, or KLOA. The garrison currently has plans for upgrading and constructing facilities and infrastructure at SBMR and KTA; and constructing or renovating runways or roadways at Wheeler Army Airfield.

SBMR has 9,880 acres of land (fee simple, leased, and ceded), and has a cantonment area, conservation land, training ranges, an impact area, supply and storage, and outdoor recreational facilities (limited hiking, skeet shooting, and archery). Lands there are classified as agricultural, state-designated urban, and the installation has conservation districts. Land uses surrounding SBMR are urban, forest, military, and agricultural. Westward of the main post lies the Wainae Kai Forest Reserve. To the east of SBMR is the Town of Wahiawa (and reservoir). Wheeler Army Airfield lies to the southeast of the main post. North of SBMR is the Kaala

Natural Area Reserve. To the south lies South Range, the former Honouliuli Preserve, which is now a state forest reserve, Military Field Station Kunia, and the Naval Magazine Pearl Harbor Lualualei Branch.

South Range consists of 1,402 acres and includes a range for small-arms live-fire qualification as well as lands set aside for an infantry brigade complex and motor pool. The land there includes parcels within the Conservation District Resource Subzone and 100 acres of Forest Reserve land. Recreational hiking occurs there. Schofield Barracks is located to the north of South Range; the former Honouliuli Preserve to the west; and Field Station Kunia and Wheeler Army Airfield is located to the east. Some agricultural land to the south of SBMR has been converted to support training and cantonment area construction in the last few years.

Wheeler Army Airfield has 1,369 acres and provides for housing and administration (provided at both Wheeler and SBMR), maintenance, and training and flight facilities. Parts of Wheeler Army Airfield have been designated agricultural and urban districts. The installation allows no hiking or hunting there.

The garrison's SBER facility is comprised of 5,154 acres of fee simple, leased, and ceded lands; and provides training and education, warehouses and storage, maintenance, and the U.S. Army Non-Commissioned Officers Academy. The training areas there are within the state-designated Conservation District Resource and Protective Subzones. The installation training area's western portion is adequate for a variety of training purposes; however, no live-fire activities occur there.

KTA consists of 9,480 acres of training areas parachute drop zones, and helicopter landing zones. The northern portion of KTA supports all tactical maneuver training, pyrotechnics, air support training, and including jungle warfare. Some of the lands there are within state-designated Conservation District Resource Subzone and much of the rest lie within the agricultural district. Recreational uses include public hunting and hiking administered by the State of Hawai'i in area A-3 and motocross in area A1. Located to the south and southwest of KTA is KLOA; agricultural land and forest to the southeast; Pupukea Paumalu Homesteads, Camp Paumalu, and the Pupukea Paumalu Forest Reserve to the west; and agricultural land, rural communities, and park lands to the northwest.

Access to KTA may be affected by additional fencing and signs restricting access, which are necessary due to the proposed live-fire use of the area. Short Range Training Ammunition has a maximum range of approximately 2,300 feet and an effective range of approximately 246 feet. When the range is in use, any traffic (on foot or in unprotected vehicles) within the surface danger zone would be prohibited. Presently, traffic (such as unauthorized public access) is not strictly controlled at KTA. Access to training lands would be restricted during fires and when surface danger zones are active.

KLOA has 23,348 acres of land that is used mostly for helicopter training, with only limited maneuver, mountain and jungle warfare, and small unit infantry maneuver training. Approximately only 5,310 acres of the training area is adequate for maneuver training; and lease agreements promote conservation of resources by prohibiting the use of live-fire, incendiary devices, tracer ammunition, explosives use, and pyrotechnics throughout the training area. KLOA is also included in the state-designated Conservation District Resource and Protective Subzones. KLOA is bordered by SBER to the south and Ahupuaa Kahana State Park to the southeast; private lands, Sacred Falls State Park and Hauula Forest Reserve to the east; private agricultural lands to the west; and the Helemano Military Reservation in the southwest.

DMR has 664 acres and includes an airfield (used primarily by private aircraft), bunkers, and earthen airplane hangars; approximately 354 acres suitable for maneuver and field training; 107 acres are developed within the cantonment area; and the remaining lands are located on steep slopes of the Waianae Mountains. Most of DMR is within the state-designated Agricultural District but is not used for agriculture. The airfield portion of DMR is within the Special Management Area (SMA). SMAs are lands within the shoreline setback, which is currently 40 feet from the shoreline, although some setback boundaries extend farther inland. SMAs are designated for more intensive management, and actions within the SMA may require an SMA use permit from the local planning commissions. DMR supports no live-fire activities and has no designated impact areas or associated surface danger zones. Ammunition is restricted to the use of blanks, and non-aerial smoke is allowed in designated areas. Public recreational uses at DMR include hunting, glider plane operation, parachuting, sky diving, hang gliding, and hiking. The land surrounding DMR is generally undeveloped and includes state-designated Prime agricultural land to the east, beaches to the north, and some residences to the northeast. Land south of DMR is mountainous and includes a state hunting area to the southwest. Land uses to the west include an inactive quarry, the YMCA's Camp Erdman, and the military's Camp Kaena. The Pacific Ocean is to the north.

PTA occupies approximately 132,000 acres, or 5 percent of the Island of Hawai'i's approximately 2.5 million acres. PTA is located in the north-central portion of the island, just to the west of the plateau formed by Mauna Loa and Mauna Kea volcanoes. Access to PTA is from Saddle Road, which connects the towns of Hilo to the east and Waimea to the north. Land uses at PTA include the cantonment area, Bradshaw Army Airfield, maneuver training areas, drop zones, live-fire training ranges, artillery firing points, an ordnance impact area, and areas unsuitable for maneuver activities.

Recreational opportunities at PTA are strictly limited to archery and bird-shot hunting in designated training areas with special permission from range control. In addition, an annual motocross race is held on Hawai'i Island that transits a small portion of Training Area 2. A portion of the installation is made available for public hunting, in accordance with terms of the lease with the state (1964). Regularly scheduled hunting at PTA helps to control feral animal populations (for sheep and goats) and enhances Army community relations.

4.18.13.2 Environmental Consequences

No Action Alternative

If this alternative were selected, no changes to land use conditions would occur. The use of Army lands would continue as they are currently designed and authorized. No changes or additions to Army lands would occur; therefore, impacts to surrounding land uses would remain less than significant. Continued coordination with the public and implementation of regulatory and administrative mitigation measures would reduce land use conflicts.

Maneuvers and live-fire training would prevent access to Army training areas by the public during training events. The Army would continue to restrict access to training areas during maneuver training to ensure there are no safety risks to the public from training or UXO. USAG-HI would coordinate with the State of Hawai'i and the public to permit access to areas when feasible.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Beneficial impacts to land use would be anticipated to occur through implementation of this alternative at USAG-HI. A reduction in training land use would be anticipated that roughly correlates with the number of Soldiers inactivated or realigned as a result of this alternative in comparison to those remaining at USAG-HI. The loss of 8,000 Soldiers would decrease use of

existing training land and training facilities by approximately up to 30 percent. This scenario would involve the demolition of some facilities and construction of new facilities within the existing cantonment area. Beneficial land use impacts from construction and deconstruction at USAG-HI are anticipated. No new range construction would occur as a result of the implementation of Alternative 1. In addition, none of the current ranges would be expanded as described for the action alternatives. Implementation of the USAG-HI institutional programs, associated land management practices and coordination among Army, federal, state, and local land managers would continue; however, a reduction in live-fire and maneuver training may beneficially increase opportunities for recreational, cultural, and public access.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor impacts, from land use conflicts and compatibility anticipated as a result of the implementation of this alternative at O'ahu and at PTA. Additional Soldiers would require the additional use of training areas and qualification ranges.

Training Infrastructure Construction. Range expansion and construction projects could occur either in the footprint of existing ranges, or in areas nearby current ranges. Siting of new ranges or expansion of existing maneuver areas would involve minimizing conflicts with existing land uses, however, at this time there is no known requirement for additional ranges associated with the stationing of up to 1,500 additional Soldiers Future ranges, if required, would be subject to additional site-specific NEPA analysis.

Live-Fire Training. No new weapon systems would be introduced as a result of this scenario. Live-fire activities would increase in frequency at USAG-HI. No changes to land use designations within existing ranges or impact areas are anticipated. Increased noise, dust, or other indirect effects associated with these stationing scenarios are not anticipated to affect off-post land uses. Conflicts with some recreational activities such as hunting could occur due to an increase in restrictions during training activities. Schools and residential areas surrounding SBMR would experience increased less compatible noise impacts.

Maneuver Training. Due to increased training, more limitations may be occur with regard to public access of open use and recreational areas. Impacts associated with public access closures are anticipated to be minor because alternate areas at these training areas would still be available for recreational and subsistence activities.

Overall, Alternative 2 would result in only minor impacts to land use on USAG-HI sites and at PTA.

4.18.14 Hazardous Materials and Hazardous Waste

4.18.14.1 Affected Environment

The ROI for hazardous materials and wastes is the area on and surrounding the potentially affected Army installations. Because fences or mountain ranges cannot always confine or reduce impacts from spills or releases of hazardous materials or wastes, areas immediately adjacent to these project locations are considered part of the ROI.

Specific regulations generally govern the use, storage, and disposal of hazardous materials and wastes. The U.S. Army Pamphlet 200-1 governs all aspects of managing hazardous materials and regulated waste by military or civilian personnel and on-post tenants and contractors at all Army facilities. The Army maintains site-specific SPCC Plans and pollution prevention plans that regulate the storage and use of petroleum products and hazardous materials, respectively. Hazardous material and waste management continues to follow Army, federal, and state regulations in order to minimize potential impacts to human health or the environment.

According to the CERCLA, a hazardous substance can be defined as any substance that, due to its quantity, concentration, or physical and chemical characteristics, poses a potential hazard to human health and safety or to the environment. CERCLA has created national policies and procedures to identify and remediate sites contaminated by hazardous substances.

The following specific hazardous materials and wastes are addressed:

- Ammunition, live-fire, and UXO;
- POLs and storage tanks;
- Contaminated and Installation Restoration Program sites;
- Lead;
- Asbestos;
- PCBs;
- Pesticides and herbicides;
- Radon; and
- Hazardous wastes.

The Army maintains updated MSDSs for all hazardous materials used. The hazardous materials and wastes used and generated within the ROI in Hawai'i are summarized in the following subsections.

Ammunition, Live-Fire, and Unexploded Ordnance. Live-fire training associated with this scenario could include spent cartridges, shell casings, and munitions, including the generation of dud and UXO; and creates explosive (and propellants) residue; which, for SBMR and South Range (the only live-fire areas on O'ahu), are stored at satellite hazardous waste storage facilities. Each training area is restricted from public access and maintains surface danger zones that establish the limits to which Soldiers or range operators may approach detonation points during training. SBMR's surface danger zones exist roughly within an arc formed by Area X (the eastern boundary), Trimble Road (the southern boundary), and the Waianae Mountain Range (the western boundary). The direction of fire is generally west to north. The area supports small arms, mortar, and artillery training. No live tube-launched, optically tracked, wire-guided missile, air-to-ground, or ground-to-air firing is conducted at the SBMR ranges (Belt Collins, 1993). In recent years, there have been no problems involving the public and the storage, transportation, and use of ammunition for training at SBMR (USAG-HI, 2004). Unused ammunition is turned back into the ammunition storage point for later use.

There are no live-fire areas at Wheeler Army Airfield; however, the airfield has an ammunition storage point with an established explosive safety quantity-distance arc. The safety arc around the ammunition storage point is in the south-central portion of the installation. Explosives quantity distance regulations (TM 9-1300-206) are imposed on ammunition storage facilities for the safety of personnel and supplies. All explosives and ammunition are stored within the ASP on Wheeler Army Airfield under the supervision of the U.S. Army Support Command, Hawai`i Directorate of Logistics. During 8 or 9 months of the year, ammunition is brought from Wheeler Army Airfield or Lualualei to PTA via boat or helicopter (USAG-HI, 2004). If boats are used, the ammunition is driven from Kawaihae Harbor to PTA. There have been no accidents involving the transport of ammunition in the last 5 years.

In addition, non-live-fire training occurs on SBER, South Range, DMR, KTA, and KLOA. Exercises at SBER use pyrotechnics and blank ammunition, and no LFX occur at SBER; therefore, no surface danger zones exist because the range is used for bivouac, maneuver, and dummy fire training activities.

Results from recent soil sampling of SBMR ranges produced some samples with levels above EPA Region IX residential and industrial Preliminary Remediation Goals (PRGs). At SBMR, two samples for Royal Demolition eXplosive (RDX) and one sample for nitroglycerin slightly exceeded the industrial PRG, but the level of exposure on a range (days or weeks) compared with the level of exposure used to calculate an industrial PRG (25 years) minimizes the concern. Although metals, such as aluminum and iron, occur naturally in Hawaiian soils, byproducts of munitions, such as lead and Royal Demolition eXplosive, contribute contaminants that could create health and safety concerns in the natural environment. Hazardous waste is transferred to the SBMR transfer and accumulation point facilities, as appropriate, for proper storage until disposal contractors and the DRMO coordinate to ensure proper disposal.

DoD 6055.9 Standard defines UXO as "explosive ordnance that has been primed, fused, armed, or otherwise prepared for action, and that has been fired, dropped, launched, projected, or placed in such a manner as to constituted a hazard to operations, installations, personnel, or material and remains unexploded either by malfunction or design or for any other cause." Grenades, mortars, and artillery weapons used in live-fire training can produce UXO; all other ammunition is inert. When a live-fire training range is closed, all UXO is normally destroyed where it is found. No known dud rounds are left in place at the conclusion of a training exercise.

UXO is suspected in various training areas and presents a potential threat to Army personnel. UXO is not cleared before maneuvers commence because there is a low level of suspected UXO. Soldiers are taught how to identify UXO and how to handle it properly.

Petroleum, Oils, Lubricants, and Storage Tanks. POLs include engine fuels (gasoline, diesel, and jet fuel), motor oils and lubricants, and diesel and kerosene heating fuels. Vehicle and heating fuels include a mixture of aliphatic hydrocarbons and such aromatic organic compounds as benzene, toluene, ethyl benzene, and xylene. CERCLA definitions of hazardous substances (42 USC 9601[14]) and pollutants exclude petroleum unless specifically listed. The EPA interprets petroleum to include hazardous substances found naturally in crude oil and crude oil fractions, such as benzene, and hazardous substances normally added to crude oil during refining. Petroleum additives or contaminants that increase in concentration in petroleum during use are not excluded from CERCLA regulations.

Most industrial operations for the Army installations in Hawai'i use the "Super Station" centralized motor pool southwest of Lyman Road at Building 2805 on SBMR. All fuel for industrial use is transported from the Hickam Air Force Base Fuel Farm via Tesoro and stored in ASTs at the Super Station (USAG-HI, 2004). Two AAFES retail filling stations are located on SBMR at buildings 80 and 1167. Each distributes different grades of unleaded gasoline, with diesel fuel also sold at the first station.

Both USTs and ASTs are used to store petroleum products and fuels at locations throughout the project area. POL storage is summarized in the following paragraphs by location, including USTs, ASTs, and oil-water separators.

Underground Storage Tanks. There are a number of in-use and permanently out-of-use USTs at SBMR and Wheeler Army Airfield. USTs at DMR and KTA are no longer in use.

The bulk storage facility at PTA was constructed in 1982 and is located at Building 343 with eight USTs. POL containers belonging to the bulk fuel facility are stored on a concrete pad with secondary containment. One UST at PTA is included on the Leaking UST list maintained by DPW. This tank was located at the dining facility in Building T-186 and was removed in May 1994. This site has been remediated, and the EPA issued a clean closure status in December 2001. In addition, two Installation Restoration Program sites exist at PTA. Both sites are landfills located in the southern portion of the main post.

Aboveground Storage Tanks. There are 18 motor pools at SBMR. Some motor pools use ASTs to store diesel fuel or used oil in conjunction with vehicle maintenance. All fuel for industrial use is transported from the Hickam Air Force Base Fuel Farm via Tesoro and stored in four ASTs at the Super Station (USAG-HI, 2004). Additionally, ASTs are used by many buildings on base to store liquid petroleum gas, also known as propane, to fuel hot water heaters.

Several ASTs on Wheeler Army Airfield in the area of the aircraft runway contain diesel or aviation gas. Emergency generators can be found throughout SBMR, SBER, and Wheeler Army Airfield. Many of these units contain integrated tanks to store fuel as opposed to being connected to separate ASTs. A list of these units is maintained by the DPW (USAG-HI, 2004). There are no known ASTs on DMR. There is one AST at KTA that is used to store diesel fuel and supports an emergency generator.

Oil-Water Separators, Wash Racks, and Grease Traps. Oil/water separators separate oil, fuel, and grease from water by gravity because these substances have a specific gravity that is lower than that of water (i.e., gasoline floats on water). Oil/water separators can create environmental issues similar to those associated with USTs. Oils are skimmed from the surface of these oil/water separators or USTs and recycled or disposed of; sediments are removed every six months or more frequently, if needed, by a service contractor. The DPW maintains a list of all oil/water separators, grease traps, and wash racks on SBMR and these facilities are inspected regularly. There are no known oil/water separators on DMR, or KTA.

Installation Restoration Program Sites. There are several sites identified on SBMR and Wheeler Army Airfield. No sites are identified at KTA. Explosive compounds have been found in surface soil and water samples at SBMR, as have metals, including iron, lead, antimony, and aluminum, and semi-VOCs. Trichloroethylene had previously been discovered in four wells supplying potable water to SBMR. The concentration of trichloroethylene exceeded regulatory limits and thus SBMR was placed on the EPA's National Priorities List; however, the site has since been remediated and was removed from National Priorities List in 2000.

The last fully recorded surface soil investigation (to establish baseline conditions for human health assessments for range exposure) was conducted by the USACE between November 8 and November 10, 2002; and covered the following areas: SBMR, KTA, KLOA, and DMR. Soil samples were taken during this time from a variety of locations across the garrison. The USACE compared soil constituent concentrations with EPA PRGs for industrial soils with the goal of identifying current soil conditions and to determine if these conditions are consistent with acceptable exposure rates. It was noted that most personnel use the training ranges in Hawai`i for only brief periods of time, totaling approximately days or weeks (over the course of one year); therefore, it is assumed that exposures to potential contaminants there are far lower than what would be assumed in the industrial soil PRGs. The study revealed that three classes of materials were generally present as soil constituents; these were metals, explosives, and semi-VOCs.

Depleted Uranium was found in August 2005 during the cleanup of UXO from a range located on SBMR and at PTA. Follow-up surveys identified other locations where Depleted Uranium was found. The source of this Depleted Uranium was determined to be tail fin sections of Spotting Rounds for the Davy Crockett Weapons System. The Army is continuing to work with the State of Hawai`i to fully investigate this issue. This action would not involve any use of Depleted Uranium ammunition. The action would not increase exposure to existing depleted uranium. Some Depleted Uranium is being cleaned up and the Army is applying for a permit for the Depleted Uranium on its ranges.

Lead. Lead sources include LBPs and lead from ordnance and ammunition. Lead was a major ingredient in house paint used throughout the country for many years. LBP is defined as any paint or surface coating that contains more than 0.5 percent lead by weight. Buildings constructed before 1978 are considered to be a risk for LBP. LBP is a hazard because it can slough off as dust or chips that children can easily inhale or ingest.

The Army environmental program maintains a database of lead surveys. The most recent version of the lead survey database for SBMR, Wheeler Army Airfield, KTA, and DMR is available through the Army DPW. As of 2005, structures on PTA have not been surveyed for lead.

Lead is also used in manufacturing ordnance/ammunition, such as that used for small arms training. The Army recognizes the potential health threats associated with lead. The Army document, "Prevention of Lead Migration and Erosion from Small Arms Ranges" (USAEC, 1998) provides management practices to minimize adverse impacts on human health and the environment from small arms ranges. The Army implements general cleanup procedures following training events to remove shell casings and other munitions residue from the ranges, and EOD specialists destroy all UXO.

Asbestos. Upon identification of renovation or demolition projects all buildings are surveyed for asbestos-containing material.

PCBs. PCBs may be found in the cooling fluid of electrical equipment, including transformers and capacitors, particularly if such equipment was manufactured before the early 1970s. PCBs are also found in fire retardants and other solid materials. The Army is committed to removing or retrofilling all electrical equipment containing regulated amounts of dielectric fluid containing PCBs.

A survey was conducted in 1991 to determine the concentration of PCBs in the electrical distribution equipment on military installations in Hawai'i. The survey results indicated that there were PCB-containing transformers and electrical equipment throughout SBMR and in a few transformers at DMR and KTA. PCB concentrations in soil samples from PTA were below the listed PRG. Devices that were found to contain regulated levels of PCB have been either removed and upgraded with non-PCB devices, or were retrofilled or removed, drained, packaged, and disposed of in accordance with 40 CFR Part 761 (PRC Environmental Management, Inc., 1995).

A preliminary assessment and site inspection of four potential contaminant sources (a former pesticide storage area, a fire training area, and two landfills) within the boundaries of PTA was conducted in March and April 1993. The analytical results for soil sampling in these areas indicated that PCB concentrations were all below the listed PRG. Devices that were found to contain regulated levels of PCBs have been either removed and upgraded with non-PCB devices, or were retrofilled or removed, drained, packaged, and disposed of in accordance with 40 CFR Part 761. No PCB-containing transformers remain at PTA.

Pesticides and Herbicides. These materials are commonly used throughout the U.S. Army at USAG-HI installations to prevent and mitigate pest-related health problems and maintain grounds and structures. These materials are currently stored in approved containers.

Due to the agricultural nature of South Range, there is suspected pesticides persisting within the soils. Further evaluation is pending.

There is one primary pesticide storage location on PTA, the DPW Natural Resources Department (Building T-93). Small volumes of pesticides are stored in plastic lockers, with

closed plastic containers as secondary containment. Larger volumes are stored in plastic containers on secondary containment pallets.

Radon. Radon is naturally occurring in low concentrations in the Hawaiian Islands and has been evaluated in both Honolulu and Hawai`i counties. Though radon has been associated with an increase risk of lung cancer, current samples throughout the Hawaiian Islands are lower than EPS's recommended action level of 4 pCi/L, and thus there is not much concern at this location.

Hazardous Wastes. The primary function of the motor pool facilities on SBMR is vehicle maintenance. Although motor fuels were previously stored and distributed at these motor pools for military vehicles, all fueling for industrial purposes now takes place at the Super Station. Motor pool facilities have designated waste storage/holding areas with secondary containment for wastes generated by shop and vehicle servicing. The waste is separated into hazardous waste such as lithium batteries or RCRA chemicals, and non-regulated waste such as recyclable oil. The hazardous waste is brought to the hazardous waste shop storage point, while the recyclable materials are brought to the Recyclable Material Shop Storage Point (USAG-HI, 2004). Hazardous wastes collected at hazardous waste shop storage points are then transferred to less than 90-day storage point on the installation before being properly disposed of.

Biomedical Waste. The Army follows strict guidelines according to AR 200-1 in the handling, use, and disposal of medical, dental, and veterinary supplies. Most medical waste within the project vicinity is produced and temporarily stored outside of the project area at Tripler Army Medical Center (TAMC). The medical clinics on SBMR and PTA produce small amounts of regulated chemical and medical waste. The medical waste is combined and temporarily stored before being disposed of at a regulated off-base disposal site. Emergency medical training medics accompany units on deployment at KTA and DMR, and biomedical waste is shipped back to SBMR with the units.

4.18.14.2 Environmental Consequences

No Action Alternative

The current uses of the affected environment would not change under the No Action Alternative, other than as discussed as a part of pre-existing trends and the on-going actions discussed below. The production and handling of hazardous materials and hazardous wastes would continue at current levels. The types and quantities of wastes would remain the same, and the existing identification and disposal methods are sufficient to minimize impacts to human health and safety. No impacts would be anticipated from asbestos, LBP, PCBs, pesticides and herbicides, biomedical waste, or radon under the No Action Alternative. There are minimal impacts to human health or safety that would result from the renovation of barracks or completion of other projects. Hazardous materials and wastes would continue to be managed in accordance with existing federal, state, installation-wide hazardous materials management plans, the current Army protocols, and SOPs.

On-going action to address issues related to depleted uranium would continue under the No Action Alternative. The Army would continue to provide information and any necessary training to the State Department of Health in a timely manner and partner with the state in the planning and execution of a survey and monitoring effort and a mutually agreed upon response.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The production and handling of hazardous materials and hazardous wastes would be reduced due to the reduction in Soldiers utilizing the installation. The types and quantities of wastes would also be reduced, thereby resulting in a beneficial long-term impact. In the short term,

there would be an increase in the demolition of outdated and no longer needed facilities. This would increase the volume of solid waste generated. In addition, an increase in asbestos and LBP disposal would be anticipated until facility reduction is completed as a result of the implementation of Alternative 1. Construction workers and Army personnel would take measures to dispose materials in accordance with regulatory requirements installation management plans. With the implementation of the USAG-HI institutional programs, BMPs and SOPs, impacts are anticipated to be minor.

Live-Fire Training. The number of required live-fire user days per year at USAG-HI would drop below current levels and no new types of weapons are anticipated to be introduced to training areas. Therefore, a reduction in the amounts of ammunition that would be used or in the generation of UXO and lead contamination on training ranges is anticipated. Hazardous materials would be generated through range maintenance activities. Soils contaminated with lead would be properly handled and reused to maintain berms. Hazardous materials and wastes would continue to be managed in accordance with existing federal, state, installation-wide hazardous materials management plans, the current Army protocols, and SOPs.

Maneuver Training. The intensity and frequency of maneuver training at USAG-HI would drop below current levels. In addition, no new maneuver areas would be required and maneuver training would be conducted in the footprint of existing ranges and trails at USAG-HI. Therefore, a reduction in hazardous materials and hazardous wastes from maneuver training is anticipated. There would be less risk of spillage of petroleum products in the training areas on O'ahu and at PTA, resulting in a net beneficial impact.

Overall, there would be a beneficial impact and reduced risk and reduced long-term production of hazardous waste as a result of implementation of Alternative 1.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Less-than-significant impacts from hazardous materials and waste would be anticipated with an increased Soldier strength of up to 1,500 Soldiers and their Families. The storage, use, handling, and disposal of hazardous materials, toxic substances, and hazardous wastes would not increase the risk to human health due to direct exposure, would not increase the risk of environmental contamination, and would not violate applicable federal, state, local, or DoD regulations. Existing management procedures, regulations, plans, and permits would be used to minimize risk.

Garrison Construction and Deconstruction. Construction and demolition of structures within the cantonment area would generate hazardous waste at SBMR and PTA due to the presence of asbestos and LBP in some of the older existing structures. The installation would ensure that any removal and disposal of these materials would be in accordance with established federal, Army, and USAG Alaska policy for handling hazardous materials and hazardous wastes. New construction would involve the testing, recordation, and mitigation (if necessary) for radon.

The requirement for motorpools would be coupled as hazardous materials collection sites for POLs as a result of the implementation of Alternative 2. The additional tactical and fleet vehicles may require additional ASTs and USTs, wash racks, and thus oil-water separators. Similar effects would occur at Wheeler Army Airfield to accommodate the additional helicopters and equipment associated with the CAB. Pesticides that may exist in soils at South Range could adversely affect nearby waterbodies during construction due to stormwater runoff. Implementation of BMPs and mitigations to minimize runoff from construction sites would be required.

For housing, child development centers, and other community support or recreational facilities, the use of pesticides and herbicides used to control insects, rodents, and plants (such as poison ivy) may pose long-term minor effects (because direct exposure to these materials is unlikely) and because the use and storage of these materials would likely be limited, and its application would be compliant with all relevant regulations. Additional short-term and long-term effects could occur from an increase in construction equipment (short term) and Soldier fleet vehicles and POVs (long-term). More vehicles would increase the potential for spills or releases of hazardous materials to the environment. Additionally, the amount of recyclable waste (from petroleum products) would increase throughout the garrison.

The increase in Soldiers from all of these stationing scenarios would result in an increased generation of biomedical wastes from dental and medical facilities on post at SBMR and TAMC. These wastes would be processed in accordance with current SOPs and regulations. Because the installation is already considered a Large Quantity Generator no additional permitting or significant actions are likely to be required.

Training Infrastructure Construction. Short-term effects would occur from the upgrade of existing ranges and the construction of new ranges to accommodate growth. These ranges might be built on areas that have been previously used and could contain lead and other materials from spent ammunition. Potentially contaminated soils that would need to be removed from ranges would be treated at an off-post facility. Additionally, construction equipment and worker vehicles operating in the range areas could cause spills of hazardous materials (POL) during the construction phase; however, in accordance with USAG-HI policy, all spills are to be cleaned up immediately and proper reporting requirements followed. The need for additional ranges or upgrade of current ranges is not known. These projects would be the subject of additional, site-specific NEPA analysis.

Live-Fire Training. This scenario would increase the frequency of Soldier live-fire training by approximately 10 percent in USAG-HI, thus increasing the amount of lead bullets and other munitions expended in the range area. Live-fire small arms ranges would retain their berms to stop projectiles fired at the ranges. Although more lead would be fired into impact berms, the installation has mitigation measures in place to ensure berms are well maintained and re-graded as needed to prevent erosion. At PTA, it is not known if the increased training would exceed historically authorized levels. If this were the case, additional NEPA analysis would be required.

No new weapon types would be introduced to USAG-HI training areas. Handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations.

Maneuver Training. Maneuver training associated with this scenario would continue to be conducted in existing training locations including KTA, KLOA, DMR, SBER, SBMR, South Range, and PTA. Transportation of personnel and use of flammable or combustible materials, such as fuel or ordnance (i.e., weaponry or equipment), could increase the potential for spills or releases of hazardous materials, especially in areas not previously used frequently. BMPs would be practiced at each of these proposed facilities, and project area personnel would follow EPA and USAG-HI protocol for using and handling hazardous materials, such as POLs. Each facility maintains strict SOPs and spill contingency plans for hazardous materials and waste, identifying specific operating responsibilities and procedures. SPCC Plans would be updated to reflect changes implemented as a result of stationing scenarios. BMPs would continue to be exercised throughout the garrison. USAG-HI's existing programs, management plans, and regulations that govern handling, use, storage, and disposal of hazardous and non-hazardous materials would remain in place. All spills should be cleaned immediately in accordance with USAG-HI Pamphlet 200-1.

4.18.15 Traffic and Transportation

4.18.15.1 Affected Environment

Traffic on O'ahu extends largely from urban development in southern coastal areas from Ewa on the west of the island to Hawai'i Kai to the east. The Island of O'ahu has four freeways, State Road 78, H-1, H-2, and H-3. State Road 78 (Moanalua Road) functions as a bypass for H-1 (Lunalilo Freeway), which spans the south portion of the island connecting the Ewa area with Hawai'i Kai. H-2 connects the Ewa area with the central portion of the island (where Schofield Barracks is located) and connects with H-1 to east of Honolulu. H-3 connects Pearl Harbor with Kaneohe Bay Marine Corps Airfield at the northeast portion of the island. The other state highways make up roughly 200 lane-miles of roadway; and the City and County of Honolulu contain approximately 1,200 lane-miles of roadway.

Very few roads connect the northern and southern portions of O'ahu (separated by the Koolau Mountains); these are Pali Highway, Likelike Highway, and H-3. The Kalanianaole Highway traverses through the east coastline between Hawai'i Kai and Kailua. H-2 and Kamehameha Highway traverses the western portion of the Koolau Range and connects Honolulu with Mililani, Wahiawa, Schofield Barracks, and Haleiwa. The training areas around Schofield Barracks are primarily accessed through the Kamehameha Highway and Kunia Road (from Ewa), and Kamananui Road and Wilikina Drive (from the North Shore). Vehicle traffic on Schofield Barracks is contained primarily through Trimble and Lyman Roads, and Kolekole Avenue. Circulation routes through KTA are contained primarily through Drum Road and Kamehameha Highway.

There is already a reduced level of service on and off post due to current local and commuter traffic. Morning and afternoon commutes tend to experience the heaviest traffic flow. There is also an increased flow of traffic around noon, when installation personnel travel to various on-post dining facilities for lunch. Additionally, a key existing traffic circulation issue for SBMR is excessive traffic through housing areas, which degrades the quality of life and increases the risk to pedestrians and cyclists.

The ROI for Schofield Barracks and the O'ahu Training Sites are as follows:

- SBMR: within the perimeter of SBMR and Wheeler Army Airfield, Kunia Road, Kamehameha Highway, and Wilikina Road;
- DMR: the corridor between SBMR and DMR, which includes the area from central O'ahu to DMR (northwest area of the island); and
- KTA: this consists of Drum Road, the corridor extending from SBMR (central O'ahu) to KTA (the windward side of O'ahu).

LOS for Highway 99, which passes in front of SBMR is currently the lowest LOS designation for traffic used by the Hawai'i Department of Transportation (Level F).

The major urban centers of Hawai‘i Island are Hilo, which is on the eastern side of the Island, and Kailua-Kona, which is on the western side. Air service to these cities is provided by Hilo International Airport and Kona International Airport, respectively. Broadly, the major cities are linked by state highways. The primary roadways on the Island are Queen Ka‘ahumanu Highway, Māmalahoa Highway, Hawai‘i Belt Road, Volcano Highway, Kawaihae Road,

and Waikoloa Road. Saddle Road is the only roadway that runs across the central part of the Island and connects PTA to the surrounding areas between Hilo and Waimea (north of Kailua-Kona). Most major roads in the area are two-lane roads.

Nearby harbors include Hilo Harbor and Kawaihae Harbor. Hilo Harbor is located on the coast of Hilo and provides access by water to Hilo. Kawaihae Harbor which is north of Kailua-Kona includes a fueling station, shipping terminal, and landing area. Kawaihae Harbor is the only harbor used by the military on Hawai‘i Island.

Saddle Road (State Route 200), a two-lane, two-way road between Hilo and its junction with Māmalahoa Highway, is the shortest route across the Island and it is the primary road providing access to and from PTA. In addition, to serving as the key roadway to PTA, it is the only road to several observatories, ranches and residential locations, and other recreational areas located towards the island's interior.

The ROI for Hawai'i includes Kawaihae Harbor and roads leading from it to PTA as well as routes from Hilo on Saddle Road to PTA.

4.18.15.2 Environmental Consequences

No Action Alternative

The existing transportation system on O'ahu is extremely stressed and traffic congestion is considerable. LOS in the USAG-HI ROI have segments rated D through F (the lowest rating). That LOS would not get worse as a result of this alternative.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Beneficial long-term effects would be anticipated from the decrease in military fleet vehicles and POVs, likely reducing the severity of the traffic flow issues at the Main Gate entrance to the installation and also reducing traffic regionally on O'ahu and reducing military convoys to and from PTA. With this stationing reduction scenario, the Soldier population would decrease and the reduced traffic would no longer compete as much with seasonal (summertime and spring) traffic conditions associated with tourism. A reduction in military use of range roads or trails within USAG-HI training areas would occur. In addition, impacts to local highways associated with military convoys would also drastically reduce. Potential conflicts between civilian use and military use of local roadways would be reduced proportionately with the reduction in overall military population at USAG-HI (up to 30 percent decrease).

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be significant but mitigable impacts anticipated on O'ahu and less than significant impacts anticipated on the Island of Hawai'i. Construction equipment and worker vehicles would have short-term impacts at the Main Gate of SBMP and Fort Shafter and at the roads around any designated construction sites.

Long-term effects would be anticipated from the increase in military fleet vehicles and POVs, potentially causing minor flow issues at the Main Gate entrance to Fort Shafter, Wheeler Army Airfield, and SBMR. With this stationing scenario, the Soldier and dependent population would increase by approximately 5 to 7 percent. The added traffic from these units would compete with seasonal tourism and resident traffic. Traffic utilizing the various main post access gates during morning and evening times may cause minor congestion for short periods of time. Currently, an increase in traffic from Kawaihai Harbor to PTA is not anticipated. If there is a need for such an increase in the future, it will be the subject of additional, site-specific NEPA analysis.

Regulatory and Administrative Measure 1. To alleviate congestion, traffic projects such as the expansion of Lyman Road and Parking Structure would help in alleviating some of the traffic congestion within the installation. Other possible projects such as the ACP bridge from Wheeler

Army Airfield to SBMP would also alleviate traffic congestion within Wheeler Army Airfield and SBMP. Without MILCON funding for these projects, traffic congestion would increase.

The new Stryker Road was completed in 2011. This trail road starts from Schofield Barracks (Macomb Gate) to Helemano Military Reservation. The new trail provides an access route to training areas that precludes the need for Stryker vehicles to utilize state highways; however, there would continue to be traffic impacts on public roadways. This would include convoy traffic on public roads that may periodically cause traffic congestion. Traffic conditions are currently operating at acceptable levels; however, during certain periods, traffic congestion occurs on roads to Wheeler Army Airfield and SBMR. The traffic volumes along the public roadways would remain at current levels, and the LOS would not change as a result of this alternative.

Military vehicles traveling between the Army installations would continue to cross public roadways. Guidance regarding convoys has been established. Examples include, per command guidance, USAG-HI convoys normally maintain a gap of 15 to 30 minutes between serials (a group of military vehicles moving together), 330 feet between vehicles on highways, and 7.5 to 15 feet while in town traffic. Per state regulation, military convoys are not authorized movement on state highways during peak-hour conditions (between 6:00 a.m. and 8:30 a.m. and 3:00 p.m. and 6:00 p.m., Monday through Friday). The maximum number of vehicle per convoy would be 24, and convoy traffic would yield to public traffic at road crossings. These measures would continue to be followed to minimize convoy impacts to traffic.

4.18.16 Cumulative Effects

The cumulative impact analyses for the various alternatives focus on impacts on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

The cumulative impact analysis focuses on impacts to the environment resulting from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions. Past and present actions are accounted for in the description of the affected environment for each resource. About 40 reasonably foreseeable future actions were identified for the Island of O'ahu and approximately 10 were identified for the Island of Hawai`i. Some of these actions are ongoing projects that would continue into the future, whereas others would be discrete projects that would be conducted in the reasonably foreseeable future. Many of these projects have had or will have specific NEPA analyses.

Island of O'ahu Actions (Reasonably Foreseeable Future)

Army

- Schofield Barracks, Whole Barracks Renewal, Quad B, Phase 2B, Building 156, FY 2013;
- Wheeler Army Airfield, CAB Complex, Phase 9, 404 Spaces, FY 2013;
- Schofield Barracks, Whole Barracks Renewal, Phase 2C, Unaccompanied Personnel Housing Buildings 157 and 158, FY 2013;
- Schofield Barracks, Area X Electrical Upgrade, FY 2013; and
- Fort Shafter, U.S. Army Pacific Command C2 Facility, Phase 2, FY 2014.

Other Military

- Stationing of MV22 (Ospreys) Aircraft, H-1 Cobra, Huey Helicopters, FY 2014;
- 1,000 additional Marines and additional flights to and around PTA
- Stationing an additional 2,700 Marines from Okinawa relocations; and

- Stationing another 3-ship Navy amphibious group at Pearl Harbor.

Non-military

- Residential Development at Koa Ridge between Pearl City and Mililani;
- Ho'opili Residential Development, Kapolei;
- Waianae Coast Emergency Alternate Route;
- Turtle Bay Resort Improvements; and
- Honolulu Rail Transit Project.

Island of Hawai'i Actions (Reasonably Foreseeable Future)

Army

- Infantry Platoon Battle Course, FY 2013; and
- PTA, Western Section, Defense Access Road (Saddle Road), FY 2015.

Non-military

- Kawaihae/Waimea Road;
- UXO Cleanup Former Waikoloa Maneuver Area and Nansay Sites; and
- Outrigger Telescopes Project.

The following sections describe the cumulative impacts that would be anticipated as a result of alternatives the Army is considering as part of Army 2020 force structure realignments.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

For the following VECs on the Islands of O'ahu , the Army anticipates a beneficial impact due to force reduction: air quality, airspace, noise, soil erosion, biological resources, facilities, energy demand and generation, land use conflict and compatibility, hazardous materials and hazardous waste, and traffic and transportation. The impacts to wetlands will be negligible. There will remain less than significant impacts to water resources. Finally, the impacts to cultural resources and socioeconomics are projected to remain cumulatively significant but mitigable. For the following VECs on the Island of Hawai'i, the Army anticipates a beneficial impact due to force reduction: air quality, airspace, noise, soil erosion, biological resources, facilities, energy demand and generation, land use conflict and compatibility, hazardous materials and hazardous waste, water resources, and traffic and transportation. The impacts to socioeconomics and wetlands on the Island of Hawai'i will be negligible. Finally, the impacts to cultural resources on the Island of Hawai'i will remain significant but mitigable.

Alternative 2: Installation gain of up to 1,500 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Air Quality. Schofield Barracks is a "major source" and maintains a Title V air permit. Individual emissions sources that contribute to the Schofield Barracks' overall status include boiler systems, generators for backup power, government and personal vehicle traffic, aircraft flight operations, various equipment operations, ordnance firing and detonation during training, controlled burning on ranges, and unplanned wildfires.

However, given historical air quality conditions, the cumulative effect of emissions associated with stationing scenarios, in combination with other construction projects and the continuing emissions from highway traffic and other sources, is not anticipated to violate any state or federal O_3 standards or any other NAAQS.

Airspace Resources. No significant cumulative effects would occur to airspace resources as a result of any of the alternatives the Army is considering as part of Army 2020 force structure realignments in Hawai'i.

Cultural Resources. There would be potential cumulative impacts on cultural resources from planned and reasonably foreseeable future projects and from Alternative 2. For Alternative 2 (Growth of up to 1,500 Soldiers), the construction and training the Army would implement would negatively impact public access to traditional areas and potentially cause destruction of cultural sites and landscapes. Historically, residential, commercial, and military development throughout the state has destroyed or damaged cultural resource sites in the State of Hawai`i. Implementation of the mitigation would reduce this combined impact to less-than-significant.

Noise. Steady development in the State of Hawai`i has continued to contribute to noise conditions experienced by residents. Urban and military development and operations associated with both produce noise from vehicles, aircraft, military training, and construction activities. Noise conditions near proposed activities associated with alternatives discussed in this document are not likely to have substantively changed in recent years because activity levels for major noise sources have not grown or declined substantively.

Soil Erosion. If the Army selects Alternative 2 (Growth of up to 1,500 Soldiers) it would contribute to cumulative impacts from soil erosion. The major influence on soil erosion in the area is the disturbance of soils, modification of slopes and drainage features, and loss or disturbance of vegetation due to agricultural conversion, military activities, fires, roads, modification of slopes and drainage features, and other development. While soil erosion and deposition is a naturally occurring phenomenon in any landscape, adverse impacts may occur when erosion rates are accelerated by human or natural disturbances.

Biological Resources. When analyzing past, present and reasonably foreseeable future actions, the cumulative impact of implementing Alternative 2 (Growth of up to 1,500 Soldiers) would be significant without the mitigation measures described below. Actions would result in significant biological impacts with the completion of ongoing Army Transformation training range projects, the new program to modernize ranges at the PTA on the Big Island, and with increased use of Army ranges by the U.S. Marine Corps to support the potential stationing of additional Marines in Hawaii and training exercises with the MV-22 Osprey aircraft.

Private and public development of land throughout the state continues to degrade native species habitat; however, habitats throughout the state continue to support common and sensitive species of plants and wildlife. The spread of invasive plant species as a result of development and construction could cause landscape changes and thereby modify habitats important to sensitive species. Notable private construction projects that may present new impacts to native species include residential development on 763 acres at Koa Ridge between Pearl City and Mililani (3,000-4,500 homes with infrastructure). Large-scale transit projects in and around Honolulu may also cause damage or destruction to native plant or animal species. Overall development (military, private, public) throughout Hawai`i is likely to continue to impact native species.

Implementation Plans developed for MMR, O'ahu training sites, and PTA are guides for conservation efforts focused on stabilizing endangered species that could be affected by military training. The intent of the installation INRMPs would be to provide goals and objectives to properly manage and conserve wildlife species while supporting the various military missions assigned. Implementation of these plans would reduce the potential cumulative impacts to less-than-significant.

Wetlands. The cumulative impacts involving wetlands are anticipated to be less than significant for all alternatives.

Water Resources. Cumulative impacts to water resources are only anticipated to occur from Alternative 2 (Growth of up to 1,500 Soldiers) and those impacts are anticipated to be less than significant. In spite of the additional training these Soldiers would require, there would potentially be less than significant to significant but mitigable long-term cumulative impacts on surface water quality from suspended sediment resulting from training activities.

Facilities. Facilities availability and utilities capacity available to support Alternative 2 (Growth of up to 1,500 Soldiers) is a major concern, and along with past, present, and reasonably foreseeable projects on the Island of O'ahu and in the State of Hawai'i could result in adverse impacts to the environment in the form of increased sewage spills, increased demands on potable water supplies, power outages, etc. These impacts would require infrastructure improvement that would have to be funded and built in order to reduce these impacts to less-than-significant. The specific requirements are not yet known and would be the subject of additional, site-specific NEPA analysis.

Socioeconomics. Long-term direct and indirect beneficial cumulative effects are anticipated because of increased sales volume and employment in the area as a result of the implementation of Alternative 2 (Growth up to 1,500 Soldiers). Additional increases in sales, employment, and income could also occur from other foreseeable actions. A lasting economic benefit would result from increased expenditure of discretionary income of Soldiers and their Families.

Schools would also be impacted throughout O'ahu for Alternative 2. Data available for the 2007-2008 school year suggests most schools operating on O'ahu have excess capacity to accommodate new students. Past Army stationing actions are already considered in these estimates provided by the State of Hawai`i Department of Education. An increase in enrollment from Alternative 2 may not significantly impact school enrollment capacity on O'ahu. Cumulative impacts may be more significant when considering potential growth collectively from Army actions, general civilian population growth, and potential expansion of the U.S. Marine Corps footprint at Kaneohe Bay.

The Island of O'ahu has a high degree of military, DoD contractor, and government jobs. The proposed force reduction at Schofield Barracks would be considered less than significant to the ROI as a whole. It is anticipated that the U.S. Army, U.S. Navy, U.S. Air Force and U.S. Coast Guard will all probably be making reductions. Thus cumulative impacts of U.S. Army, U.S. Navy and other military service reductions, along with government hiring freezes and cuts would have significant adverse cumulative socioeconomic impacts. There is not enough known about the plans of other services yet to say what the combined economic impacts would be. Like the Army, the other services may tie reductions to the changing world security situation and may not be able to predict exactly what reductions will be. Decisions may be made at the beginning of each year, based on each service's needs and the global mission, as the move toward Army 2020 occurs. Any site-specific NEPA analysis that the Army conducts will have to take into account actions by other services, as they become known and as appropriate.

Energy Demand and Generation. The cumulative impacts of all alternatives are anticipated to be less than significant with the exception of Alternative 1 (Reduction of up to 8,000 Soldiers) which is anticipated to have a cumulative beneficial effect on energy demand.

Land Use Conflict and Compatibility (including Recreational Activities). The cumulative impacts of all alternatives are anticipated to be less than significant with the exception of

Alternative 1 (Reduction of up to 8,000 Soldiers) which is anticipated to have a cumulative beneficial effect on land use.

Hazardous Materials and Hazardous Waste. The cumulative impacts of all alternatives are anticipated to be less than significant with the exception of Alternative 1 (Reduction of up to 8,000 Soldiers) which is anticipated to have a cumulative beneficial effect on hazardous material/hazardous waste.

Traffic and Transportation. Only Alternative 2 (Growth of up to 1,500 Soldiers) would contribute to an increase in the volume of civilian and off-duty traffic generated by the stationing of new personnel and their dependents at locations in Hawai`i. Military traffic on the state and County road systems would be consistent with historic trends, and much of the traffic would use military vehicle trails rather than public roadways.

Traffic impacts associated with existing military vehicle trail crossings of public roadways would be minimal because the convoy traffic yielding to public traffic and traffic-related impacts associated with construction would be minimal. Traffic along the roadways in the area is anticipated to increase because of the projected population growth and development on both O'ahu and Hawai`i; however, Alternative 2 would result in significant cumulative impacts on off-post traffic when considered cumulatively with other actions and the current traffic conditions on the Island of O'ahu. These significant effects can be mitigated through planned roadway and transit improvements throughout Hawai`i. Some pressure on traffic conditions however, may be relieved upon completion of the light rail transit project planned to follow Farrington, Kamehameha, and Nimitz highways. An increase in use of public transportation would decrease the overall amount of vehicles traveling on highways in those areas. In addition, construction of the North-South Road, Kapolei Highway, and the Waianae Coast Route may also relieve traffic pressure on heavily traveled routes. These mitigation measures would be looked at in the site-specific NEPA analysis that would be required for implementation of Alternative 2.

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4.19 FORT SILL, OKLAHOMA

4.19.1 Introduction

Fort Sill borders the City of Lawton, Oklahoma and covers approximately 94,000 acres (Figure 4.19-1). The installation is the home of the U.S. Army Fires Center of Excellence, an organization combining the U.S. Army Artillery Center and School and the U.S. Army Air Defense Artillery Center and School. Principal operational units at Fort Sill include the 75th and 214th Fires Brigades, the 428th and 434th Field Artillery Brigades, and the 31st and 30th Air Defense Artillery Brigades. BRAC increases included relocation of 15 closed National Guard and Army Reserves UICs to the installation. Fort Sill is also one of the five locations for Army Basic Combat Training.

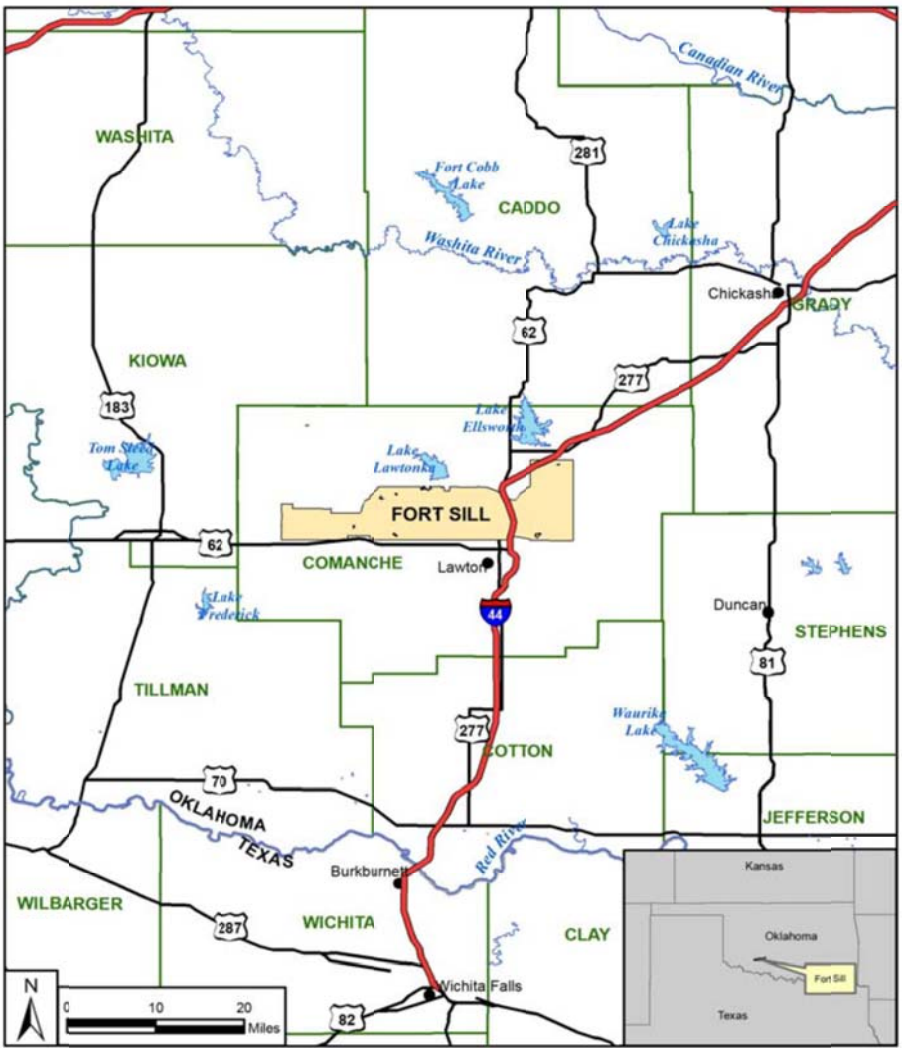

Figure 4.19-1. Fort Sill

As the home of the U.S. Army Fires Center of Excellence, the installation mission is to train Soldiers and develop Field Artillery and Air Defense Artillery leaders, design and develop fire support for the force, support unit training and readiness, mobilize and deploy operating forces, and maintain installation infrastructure and services.

As a result of the implementation of the Proposed Action, the permanent party Soldier and Army civilian employee population of Fort Sill could be reduced by up to 4,700 personnel and their accompanying dependents. In addition, there would be a projected 10 percent reduction in the number of students that train at Fort Sill annually. Much of the institutional training would continue as it currently is being conducted by the U.S. Army Fires Center of Excellence and other TRADOC units, however fewer students would be trained as the demand for the number of Soldiers trained for specific military functions, such as field artillery operations, would decrease in relative proportion to the overall size of the Army.

4.19.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, Fort Sill does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 4,700 Soldiers and Army Civilians); however, Fort Sill does anticipate significant adverse socioeconomic impacts to economic activity, population, school districts, public services, medical services, and Family support services as a result of Alternative 1. Table 4-19-1 summarizes the anticipated impacts to VECs from each alternative.

Table 4.19-1. Fort Sill Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 4,714
Air Quality	Beneficial	Beneficial
Airspace	Negligible	Negligible
Cultural Resources	Less than Significant	Significant but Mitigable
Noise	Significant but Mitigable	Beneficial
Soil Erosion	Negligible	Negligible
Biological Resources	Negligible	Negligible
Wetlands	Negligible	Negligible
Water Resources	Negligible	Beneficial
Facilities	Negligible	Beneficial
Socioeconomics	Minor	Significant
Energy Demand and Generation	Negligible	Beneficial
Land Use Conflict and Compatibility	Negligible	Beneficial
Hazardous Materials and Hazardous Waste	Negligible	Less than Significant
Traffic and Transportation	Minor	Beneficial

4.19.1.2 Valued Environmental Components Dismissed from Detailed Analysis

For the VECs discussed in this section, no more than a beneficial or negligible impact is anticipated. Therefore, these VECs are not being carried forward for detailed analysis, as no potential for significant impacts exists.

- ***Air Quality.*** EPA Region 6 and the Oklahoma Department of Environmental Quality regulate air quality in Oklahoma. The CAA gives EPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50). The NAAQS set acceptable concentration levels for seven criteria pollutants: PM, fine particles, SO_2, CO, NO_x, O_3, and lead. Short-term standards (for 1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. Each state has the authority to adopt standards stricter than those established under the federal program; however, Oklahoma accepts the federal standards. Federal regulations designate AQCRs that are in violation of the NAAQS as nonattainment areas and those that are in accordance with the NAAQS are attainment areas.

  Fort Sill lies within an air quality attainment area for all HAPs, and no additional clean air permits would be required for this action (Sherman, 2011).

  Under the No Action Alternative, Fort Sill would continue to emit emissions at the current permitted levels. There would be no changes to current emissions level or air quality impacts and the installations current air permit would remain in effect.

  The No Action Alternative would reduce air emissions of NAAQS pollutants and HAPs through a decrease in vehicle traffic and use of field generators. Minor short-term impacts to air quality would be anticipated from building demolitions, but overall impacts would be beneficial impacts from reduced long-term emissions resulting from a reduced volume of vehicle, generator, and stationing source emissions. There would be no exceedance of permitted installation air emissions as a result of the implementation of Alternative 1.

- ***Airspace.*** Fort Sill has 243 square miles of FAA-designated SUA from surface to 40,000 feet. The Fort Sill ARAC has been delegated an additional 5,700 square miles of approach control airspace surface to 7,000 feet. The installation has access to this airspace continuously and it is controlled by the ARAC of Fort Sill, Oklahoma (Thorton, 2011). Neither alternative includes changes (neither horizontal nor vertical) to the FAA-designated SUA, to include access; therefore, there would be no impact to airspace

- ***Soil Erosion.*** The Soil Conservation Service surveyed soils on Fort Sill (outside of the impact areas) in 1970, and identified 32 soil mapping units. For the most part, Fort Sill soils closely mimic their parent material. East Range soils are predominantly reddish clay and fine grained sand assemblages in the Zaneis, Lucien-Zaneis-Vernon complex, and Vernon series. East Range bottomland soils are generally in the Port loam and Lawton loam series. From the cantonment area to Blue Beaver Valley to the south of the Wichita Mountains, the soils reflect their rhyolitic background and are in the Foard, Tillman, Vernon, and Hollister soil series. Soils south of the mountains west of Blue Beaver Valley reflect their granitic past, and belong to the Foard-slickspot complex, Lawton loam, Windthorst sandy loam, and Port loam series. The mountains themselves are granite outcrops and stony rock land. These alternatives are not anticipated to impact soil erosion rates. Fort Sill soils, in general, are susceptible to erosion. Erosion problem areas on Fort Sill, from east to west, include the eastern boundary, particularly in the Potato Hill area; the Adams Hill area; the area just to the southwest of the cantonment area; the northwestern portion of West Range; and the far western portion

of Quanah Range. These areas erode regardless of man-made disturbance. Fort Sill utilizes a variety of BMPs to reduce soil impacts (Fort Sill, 2003). Neither alternative includes major ground-disturbing activities; therefore, there would be no impact to any geology or soil resources.

- ***Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species).***

  Vegetation. Fort Sill lies in an ecological transition area where tall-grass prairie merges with short-grass prairie, and soil variation has created diverse plant communities. Grassland communities constitute more than 70 percent of Fort Sill. There are three major grassland types. Tall grasses like big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*) dominate sites with deep soils. Native legumes and other forbs are also numerous in these areas. Medium and short grasses like blue grama (*Bouteloua gracilis*) and sideoats grama (*B. curtipendula*) occupy more droughty hardland and slickspot soils. Medium and short grasses like hairy and sideoats grama (*Bouteloua spp*.) and fall witchgrasses (*Leptoloma cognatum*) are abundant on very shallow rocky soils. There are no federally protected plant species on the installation. Oklahoma does not have a law that protects rare plant species, so no official list of state rare plants exists (Fort Sill, 2003).

  Wildlife. The diversity of natural environments at Fort Sill provides suitable habitat for a wide variety of animal species. Frequently encountered animal life includes a wide range of common invertebrates, birds, fish, reptiles, amphibians, rodents and feral hogs. Large herbivores and large carnivores such as mountain lions (*Felis concolor*), although present, are less frequently encountered.

  Game species found at Fort Sill include bobwhite quail (*Colinus virginianus*), white-tailed deer (*Odocoileus virginianus*), mourning dove (*Zenaida macroura*), pheasant (*Phasianus colchicus*), elk (*Cervus elaphus*), raccoon (*Procyon lotor*), various waterfowl species, and coyote (*Canis latrans*). Common mammals inhabiting the installation include bobcat (*Lynx rufus*), striped skunk (*Mephitis mephitis*), cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), beaver (*Castor canadensis*), opossum (*Didelphis virginiana*), prairie vole (*Microtus ochrogaster*), deer mouse (*Peromyscus maniculatus*), white-footed mouse (*P. leucopus*), and several bat species. Fish species commonly found on Fort Sill include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), green sunfish (*L. cyanellus*), and channel catfish (*Ictalurus punctatus*).

  Federally-listed species that may occur in Comanche County are the black-capped vireo (*Vireo atricapillus*), least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), and whooping crane (*Grus americana*). The black-capped vireo is the only federally-listed species documented to occur at Fort Sill. Habitat for the black-capped vireo is scattered within the training areas north and west of the cantonment area (Fort Sill INRMP).

  A reduction in force would decrease the frequency of land usage in the Fort Sill training areas, limiting potential Soldier disturbance of sensitive species and habitats. No effect on federally- or state-listed, threatened, or candidate species is anticipated.

  Neither alternative includes activities that would have additional impacts on fish and wildlife, threatened and endangered species, habitat, natural resources, or vegetation. There would be no impact to biological resources, and analysis of impacts is; therefore, not carried forward for further analysis.

- ***Wetlands*.** Fort Sill wetlands were inventoried using February 1983 and March 1984 photographs. The USFWS completed verification of wetland information from aerial

photographs taken in 1995. This survey indicated 1,174 acres of wetlands on Fort Sill. These 1,174 acres include 333 acres of Lacustrine and Limnetic type wetlands, 188 acres of Riverine type wetlands, and 653 acres of Palestine type wetlands. In addition, 352 miles of linear wetlands were indicated in the mapping report (Fort Sill, 2003). No effects on wetlands would be anticipated as a result of this action provided appropriate BMPs are enforced during construction and demolition activities. Neither alternative includes any major ground-disturbing activities that would result in un-permitted loss of wetlands; therefore, there would be negligible impact to wetlands anticipated.

- ***Water Resources.***

Surface Water. Many small impoundments have been constructed on Fort Sill. There are 227 ponds and lakes ranging in size from less than 1 acre to the 293-acre Lake Elmer Thomas. Ponds and lakes are managed for fisheries or designated for wildlife use. Many ponds are used for firefighting purposes.

Fort Sill is in the surface drainage basin of the Red River and its tributaries. The Cache Creek system, the primary tributary in the Lawton-Fort Sill area, drains from the north to south ending in the Red River. Cache Creek has two main forks, East Cache and West Cache, which merge just prior to reaching the Red River. East Cache Creek is the main fork. On East Cache Creek and its primary tributary, Medicine Creek, two lakes (Lawtonka and Ellsworth) supply Fort Sill and Lawton with potable water.

About 52 percent of Fort Sill is within the East Cache Creek watershed; 40 percent lies within the West Cache Creek watershed; and 8 percent is in the Beaver Creek watershed. A section of East Cache creek is listed on Oklahoma's 303(d) list of impaired waters for lead and turbidity. Beaver Creek watershed supplies Waurika Reservoir, which supplements Lake Lawtonka and Lake Ellsworth to provide Lawton-Fort Sill and other communities with water (Fort Sill, 2003).

Groundwater. Groundwater in the area around Fort Sill occurs in three aquifers: the Arbuckle Group (Cambrian and Ordovician), the Post Oak Conglomerate (permian and Cimarronian), and Alluvian (Quaternary). All are partially recharged from Fort Sill surface waters.

The Arbuckle Group aquifer is the largest source of groundwater in the immediate area of Lawton-Fort Sill, but it is generally poor quality. Oklahoma has designated beneficial uses for the Arbuckle Group as irrigation, municipal and domestic water supply, industrial, and non-irrigation agricultural. Several small communities in the area use this water source.

The Post Oak conglomerate consists of limestone conglomerate, about 40 feet thick near limestone outcrops. It generally yields only about 10 gpm to wells. It is considered a minor aquifer.

The Alluvial aquifer is made up of sand, clay, and gravel along floodplains, and it is as much as 32 feet thick. Water yields vary from 5-500 gpm. Recharge is by precipitation on floodplains and stream bed infiltration. Most water produced is generally poor quality and used for domestic and stock. It may occasionally exceed state drinking water primary or secondary standards (Fort Sill, 2003).

Water Rights. The Oklahoma Water Resources Board permits water rights. Although surface water is available, Fort Sill has no substantial water use rights (Silverstrim, 2011).

Water Supply and Demand. Fort Sill purchases water for domestic and other uses from the City of Lawton. The installation operates two pump stations, which draw water from Lawton's 24- and 16-inch transmission mains that pass through the installation on

an easement. The maximum combined flow rate of the two pump stations is 11.5 mgd. Installation water usage is generally less than 2 mgd. Two water treatment facilities are operated by the City of Lawton located in Medicine Park and Southeast Lawton. Primary water sources are Lake Lawtonka and Lake Ellsworth, owned by the City of Lawton, and Waurika Lake, a federal reservoir (Fort Sill, 2003).

Wastewater. Fort Sill's wastewater treatment system is owned and operated by American Water Enterprises. The on-post WWTP has a design capacity of 4.3 mgd, while the annual average flow is 1.7 mgd. The WWTP discharges treated effluent into East Cache Creek under a NPDES permit (Bennett, 2010).

Stormwater. Fort Sill has a General Permit for the Small MS4, and a Multi-Sector Stormwater General Permit for stormwater discharges from industrial facilities. Construction projects over 1 acre each get their own Stormwater Permit from the state for discharges from construction activities. Fort Sill's MS4 Stormwater Permit requires the use of BMPs on all projects to limit erosion and sedimentation. Stormwater retention and reuse technologies are specified in 5,000 square foot or larger project designs to achieve compliance with the Energy Independence and Security Act requirements (Silverstrim, 2011).

There would be negligible impact under the No Action Alternative. Fort Sill would continue to generate wastewater, impact surface water, and consume potable and non-potable water at its current rates of consumption, purchasing water for domestic consumption and other uses from the City of Lawton.

BMPs would be followed during all construction and demolition activities to reduce sedimentation and impacts to surface waters. Alternative 1 would have only minor temporary effects on Fort Sill's water resources and would not violate any state or federal water quality regulations. Demolition activities would have beneficial long-term impacts, resulting in less impervious areas and reducing runoff quantities and flow rates. Minor beneficial impacts would occur to surface waters from a reduction in training, and water demand would be reduced on and off post as the Soldier and Army civilian employee populations decreased.

- ***Facilities.*** Fort Sill is comprised of 7,800 acres of cantonment area and 85,608 acres of rangeland. Rangeland includes 37,306 acres of impact area and 48,302 acres of training areas. There are 16 small arms ranges, 6 non-firing courses, and 33 training areas utilized for live fire. In addition, about 3,000 acres of land are available for agricultural use. The cantonment area is laid out like a small city with areas for housing, industrial, administrative, medical, recreation, and an airfield. In addition to the 2,400 buildings and other structures on the installation, Henry Post Airfield has a 5,000- by 200-foot paved runway and two sod runways. Other airstrips on Fort Sill include a UAS strip at Frisco Ridge, three sod airstrips used as staging fields and helicopter landing zones, and five paved helicopter landing pads (Fort Sill, 2003).

  There would be no impact anticipated from the continued implementation of the No Action Alternative. Fort Sill would continue to operate and maintain its existing facilities in accordance with its current requirements. Fort Sill would continue to implement the FRP.

  The proposed force reduction would have a minor beneficial effect on facilities, allowing for the removal and release of temporary, relocatable, buildings and the demolition of some older, energy inefficient buildings. With the implementation of force reduction, some permanent facilities may be able to be redesignated to support units remaining at Fort Sill to provide more space and facilities better able to meet tenant unit needs.

Additional actions would be programmed under the FRP to increase installation building performance and energy efficiency to save on installation operating costs and utilities.

- ***Land Use Conflicts and Compatibility.*** Fort Sill is in Comanche County in southwest Oklahoma 90 miles southwest of Oklahoma City and 50 miles north of Wichita Falls, Texas. The Wichita Mountains National Wildlife Refuge is adjacent to the installation's northwest boundary. The cantonment area is within the corporate limits of the City of Lawton, Oklahoma. Lawton borders the installation to the south of the cantonment area from the western portion of East Range to the eastern portion of West Range and is the only major metropolitan area near the installation. Mixed land uses, including sparsely populated residential and agricultural areas lie along other boundaries of the installation. Smaller towns near Fort Sill include Cache, Indiahoma, Elgin, and Medicine Park.

  All of the cantonment area, much of Lawton, and some lands adjacent to Fort Sill are within NZ II of large-caliber weapons ranges. Fort Sill has obtained DA approval for six ACUB zones along the northeastern, eastern, southern, and western installation boundaries. The purpose of the ACUB program is to limit incompatible development around the installation and to protect future training activities on lands outside the installation. The total area of the six buffers proposed for land easements to prevent future development is 19,415 acres. The Army has appropriated money for the purchase of the buffer areas and has a cooperative agreement with the DoD, its partners Land Legacy and the USDA, and the first cooperating landowner. The buffers will neither increase nor decrease available training land, but will help to ensure that units at Fort Sill can use the full extent of available training land (U.S. Army, 2008) while minimizing impacts to the surrounding community.

  No changes in existing land use would occur under the No Action Alternative. The installation would continue to train, construct and maintain facilities, and support recreation and other uses.

  The implementation of Alternative 1 would result in a minor decrease in training land use. This has the potential to reduce noise and military training on Fort Sill's training areas across the installation. The demolition of some facilities might open areas for more compatible land use. Overall land use impacts are anticipated to be beneficial impacts.

- ***Energy Demand and Generation.***

  Electric. The entire Fort Sill cantonment area is served by all utility systems, including electric, gas, water, sewer, and communications. All primary electric power is supplied by American Electric Power from a 50-MW, 69,000-volt substation and a newer 80-megavolt-ampere substation. The electric system on the installation is owned by the government and is currently being upgraded and converted to an underground distribution system. Fort Sill used 167,647,200 kWh in FY 2004 (AAFES, 2011).

  Natural Gas. Fort Sill's natural gas system has been privatized and is currently owned and operated by Oklahoma Natural Gas. Fort Sill uses 600,000-700,000 dekatherms of natural gas per year depending on weather. The installation has a contract with CenterPoint Energy to transport 10,800 dekatherms per day if required (AAFES, 2011).

  Sustainable Energy. Geothermal wells have been installed across the installation for heating and cooling purposes. New constructions, as well as older structures, are being outfitted with solar panels to supplement energy usage. Currently, the wastewater reuse recycling system is being installed at the WWTP and plans are in place to construct a microgrid system that will use solar and wind power to support the installation during power outages (Brown, 2011).

Fort Sill has adequate access to its energy supply and would continue to use energy at its current rates under the No Action Alternative. Only negligible impacts are anticipated.

A reduction in force would likely cause a decrease in energy demand and usage across the installation. Alterations or relocations of existing utility systems would not be anticipated. Fort Sill would continue to pursue initiatives for increased energy efficiency, to include the demolition of older less efficient buildings as a result of this alternative. Overall impacts to energy demand and use would be beneficial.

Fort Stewart anticipates that the implementation of any of the alternatives would result in negligible impacts for those VECs discussed above. The following provides a discussion of the VECs requiring a more detailed analysis, as they are anticipated to have the potential of a higher level of impact as a result of the implementation of the Proposed Action alternatives.

4.19.2 Cultural Resources

4.19.2.1 Affected Environment

The Fort Sill Military Reservation contains a variety of cultural resource properties located across the installation. This includes the Fort Sill NHL District. There are many additional properties on Fort Sill that are listed on the NRHP including buildings, historic and archaeological sites, and cemeteries. Fort Sill's ICRMP is currently being revised and updated. Cultural resources are currently being managed through project reviews on a case by case basis in accordance with 36 CFR 800 (Savage, 2012).

4.19.2.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, cultural resources would continue to be managed and monitored through the CRMP. Installation cultural resource staff would continue to consult with the SHPO on any action that could potentially impact eligible cultural resources. Less than significant impacts to cultural resources would occur under the No Action Alternative.

Alternative 1: Force Reduction (up to 4,700 Soldiers and Army Civilians)

Fort Sill anticipates significant but mitigable adverse impacts from potential facilities demolition and long-term minor beneficial impacts to cultural resources as decreased training activity would reduce the risk of inadvertent disturbance of artifacts and archaeological sites. A reduction in force size would cause an increase in vacant structures within the cantonment area. This poses the threat of potential abandonment to historic buildings and structures that could be eligible for potential listing on the NRHP. The Fort Sill CRMP staff would continue to monitor historic structures as a result of the implementation of Alternative 1.

Any ground disturbing activity resulting from the removal of structures would be coordinated with Fort Sill's CRM and the SHPO as necessary. The risk of NHPA, ARPA, and NAGPRA violations would not increase under the Proposed Action. By implementing appropriate mitigation measures along with continued monitoring by CRMP staff, there would be a very low potential for adverse effects to historic buildings and/or archeological resources. Facilities demolition would be conducted in accordance with the current agreements between Fort Sill's CRM and the state for consultation and management of historic structures. If the undertaking has the potential to adversely affect historic properties, consultation with the SHPO would occur per 36 CFR 800 as required.

4.19.3 Noise

4.19.3.1 Affected Environment

Typical activities at Fort Sill that produce noise include blast noise from artillery and impacting artillery rounds, fixed and rotary-wing aircraft, Air Force operations at Quanah Range, close air support training, general personnel activities of the cantonment area, and roadway noise of major arterial routes passing through Fort Sill.

The Fort Sill IONMP was completed in June 2008 by the U.S. Army Center for Health Promotion and Preventive Medicine. The IONMP provides a methodology for analyzing exposure to noise hazards associated with military operations and provide land use guidelines for achieving compatibility between the Army and the surrounding communities. The noise impact on the community is translated into NZs. The program defines three NZs. NZ I is compatible for most noise-sensitive land uses. NZ II is normally incompatible for noise-sensitive land uses. NZ III is incompatible for noise-sensitive land uses.

The conclusions from the IONMP reflect that the NZs from small arms training are contained within the Army installation boundaries. Large caliber operations have NZs that go off post and may produce peak noise levels that can generate a moderate or high risk of complaints beyond the installation boundary (U.S. Army, 2008).

4.19.3.2 Environmental Consequences

No Action Alternative and Alternative 1

There are no changes to anticipated impacts from noise under the No Action Alternative. Noise would continue to be a potentially significant impact that is mitigated to less than significant through the management and scheduling of training activities. Fort Sill would continue to manage the duration, frequency and timing of noise generating training events to reduce potential impacts to sensitive noise receptors and the surrounding communities.

Alternative 1: Force Reduction (up to 4,700 Soldiers and Army Civilians)

Alternative 1 would result in a beneficial impact to noise. There are no changes to anticipated impacts from noise under this alternative. A reduction in personnel would decrease the frequency of noise generating training events and the amount of noise created by the installation during field training and LFX resulting in a minor beneficial impact. While the frequency of training events would decrease, however, the types of peak noise generating events that cause NZs off post (firing of artillery and other large-caliber systems) would continue to occur. Noise contours would be projected to diminish with a decrease in the frequency of noise generating training events.

4.19.4 Socioeconomics

4.19.4.1 Affected Environment

Fort Sill is located near Lawton, Oklahoma, about 90 miles southwest of Oklahoma City. The ROI consists of Comanche County.

Population and Demographics. The Fort Sill population is measured in three different ways. The daily working population is 11,730, and consists of Soldiers and Army civilians working on post. The population that lives on Fort Sill consists of 3,400 Soldiers and an estimated 2,240 dependents, for a total resident population of 5,640. This does not include temporary trainees and students, which add significantly to the resident on-post population. Fort Sill averages a daily population of over 9,500 temporary trainees and students. Finally, the portion of the ROI

population related to Fort Sill is 20,991 and consists of Soldiers, civilian employees, and their dependents living off post.

The ROI county population is almost 125,000. The 2010 population increased 7.9 percent over the year 2000. The racial and ethnic composition of the ROI is presented in Table 4.19-2.

Table 4.19-2. Racial and Ethnic Composition

State and Region of Influence Counties	Caucasian (Percent)	African American (Percent)	Native American (Percent)	Hispanic (Percent)	Asian (Percent)	Multiracial (Percent)	Other (Percent)
Oklahoma	69	7	9	2	8	5	0
Lawton	59	17	5	11	2	5	1

Employment, Income, and Housing. Fort Sill currently has 1,400 Family housing units on post managed through a partnership with Picerne Military Housing through the RCI. Permanent party Soldiers occupy all available on-post housing units. Fort Sill has barracks space for 2,546 unaccompanied permanent party personnel. Permanent party Soldiers are allotted 118 square feet of living space while Trainee Soldiers are allotted 72 square feet. Approximately 5,000 off-post Family housing units support Fort Sill Soldiers (Love, 2012). Military students impact the community differently as they are housed on post, but generate demand for hotels and dining regionally as their Families travel to graduations.

Compared to 2000, the 2009 employment (private nonfarm) increased by 16.8 percent in Comanche County. State employment increased by 7.41 percent. Total private nonfarm employment for Comanche County in 2009 was 32,225. Total private nonfarm employment for the State of Oklahoma in 2009 was 1,290,278. The 2005-2009 median home value was $98,800 in Comanche County, and the state median value was $185,400. The 2009 median household income was $45,672 in Comanche County. State median income was $41,716. Based on 2009 data, the percent of the population below the poverty level was 15.00 percent for Comanche County. State poverty level was 16.10 percent.

***Schools*.** Permanent party military dependants living on post attend Lawton Public Schools. There are two elementary schools located on post that serve 698 military dependents. All middle and high school students residing on post attend off-post schools. Military connected children contribute as many as 6,636 school-age children to the regional education system (Installation Management Command-Central District Information Summary). Children living off post are served by various school districts in the surrounding as noted in Table 4.19-3.

Table 4.19-3. School Capacity Data

District Name	District Size	Number of Schools	Total Children	Total Military Connected Children	Military Connected Children (Percent)
Bishop School	Tier Two	1	471	178	37.79
Boone-Apache Schools	Tier Three	1	639	2	0.31
Cache Public Schools	Tier Two	1	1,660	225	13.55
Central High Public Schools	Tier Two	1	433	30	6.93
Chattanooga Public Schools	Tier Three	1	291	20	6.87

District Name	District Size	Number of Schools	Total Children	Total Military Connected Children	Military Connected Children (Percent)
Cyril Public School	Tier Three	1	362	8	2.21
Duncan Public Schools	Tier Two	1	3,862	75	1.94
Elgin Public Schools	Tier One	1	1,973	527	26.71
Fletcher Public Schools	Tier Two	1	500	54	10.80
Flower Mound School	Tier Two	1	324	130	40.12
Frederick Public School	Tier Three	1	887	15	1.69
Geronimo Public Schools	Tier Two	1	512	89	17.38
Indiahoma Public Schools	Tier Two	1	199	64	32.16
Lawton Academy of Arts and Sciences	Tier Two	1	112	39	34.82
Lawton Christian School	Tier Two	1	427	100	23.42
Lawton Public Schools	Tier One	34	15,860	4,836	30.49
Marlow Public Schools	Tier Three	1	1,292	3	0.23
Private/Charter School(s)	Tier Three				0.00
St. Mary's Catholic School	Tier Two	1	156	61	39.10
Sterling Public Schools	Tier Two	1	430	69	16.05
Trinity Christian	Tier Two	1	83	40	48.19
Walters Public Schools	Tier Two	1	716	71	9.92
Fort Sill Totals		54	31,189	6,636	21.28

Police Services. The Fort Sill Police Department oversees policing operations, patrols, general and absent without leave investigations, training, and traffic accident and criminal investigations. city, county, and state police departments provide law enforcement in the ROI.

Fire and Emergency Services. The fire department responds to emergencies involving structures, facilities, transportation equipment, hazardous materials, and natural and man-made disasters; directs fire prevention activities; and presents public education programs. The Fort Sill Fire and Emergency Services Division has mutual aid agreements with Comanche, Cotton, Grady, and Tillman counties the City of Lawton, Reynolds Army Community Hospital, Wichita Mountains National Wildlife Refuge, Great Plains Technology Center, the City of Lawton Emergency Communications Center (911), and the State of Oklahoma/City of Tulsa (800MHz Radio System) (Langford, 2012).

Medical Facilities. Fort Sill's on-post medical services are administered at Reynolds Army Community Hospital. The hospital and the two Troop Medical Clinics are located on the installation; the Frontier Medical Home Clinic is located in the Lawton Community. These facilities provide healthcare to basic trainees, AIT students, reservists, Active Duty personnel and their Family members, as well as retirees and their Family members living within a 70-mile radius of the facility (Rhodes, 2012).

Family Support Services. Fort Sill ACS is a human service organization that has a number of programs and services in place to assist Soldiers and their Families under FMWR. Child, Youth and School Services, a Division of FMWR, provides facilities and child care (ages 6 weeks - 5 years), School Age Care (ages 6 -10 years), Middle School and Teen program (11-18 years), sports and instructional classes to children of Active Duty military, DoD civilian, and DoD

contractor personnel. Children of retired military are eligible to participate in the Middle School and Teen, Youth Sports and SKIES programs. Members of the local community are able to participate in the Youth Sports program. Business programs provide a variety of food, beverage, and recreational outlets. Community sports and recreation support provide a diverse offering of sports, fitness, and community recreational and leisure activities (Spencer-Ragland, 2012).

4.19.4.2 Environmental Consequences

No Action Alternative

Fort Sill's continuing operations represent a beneficial source of regional economic activity. No additional impacts to housing, public and social services, public schools, public safety, or recreational activities is anticipated.

Alternative 1: Force Reduction (up to 4,700[4] Soldiers and Army Civilians)

Economic Impacts. Alternative 1 would result in the loss of approximately 4,700 military employees (Soldier and Army civilian employees), each with an average annual income of $41,830. In addition, this alternative would affect an estimated 2,630 spouses and 4,525 dependent children, for a total estimated potential impact to 7,155 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 11,869 military employees and their dependents.

Based on the EIFS analysis, there would be significant socioeconomic impacts for population and employment in the ROI for this alternative. There would be no significant impacts for sales volume or income. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.19-4. Table 4.19-5 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.19-4. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Positive	9.92	8.63	7.24	7.77
Negative	- 12.21	- 10.04	- 5.25	- 3.75
Forecast Value	- 9.23	- 8.45	- 13.61	- 9.50

Table 4.19-5. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	- $206,347,900	- $219,587,700	- 5,306 (Direct) - 675 (Indirect) - 5,982 (Total)	- 11,869
Percent	- 9.23	- 8.45	- 13.61	- 9.50

[4] Calculations used a number of 4,714 Soldiers and civilians for estimating socioeconomic impacts. This number was derived by assuming the loss of 35 percent of the installation's Active Duty Soldiers, and up to 15 percent of the civilian workforce. As discussed in Chapter 3, this number is rounded to the nearest hundred personnel when discussing impacts of Alternative 1.

The total annual loss in volume of direct and secondary sales in the ROI represents an estimated -9.23 percent change from the total current sales volume of $2.23 billion within the ROI. It is estimated that state tax revenues would decrease by approximately $9.27 million as a result of the loss in revenue from sales reductions. Some counties within the ROI supplement the state sales tax of 4.5 percent by varying percentages, and these additional local tax revenues would be lost at the county and local level. Regional income would decrease by 8.45 percent. While approximately 4,700 military and government civilian positions would be lost within the ROI as a direct result of the implementation of Alternative 1, EIFS estimates another 592 direct contract service jobs would be lost, and an additional 675 job losses would occur indirectly from reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 5,982 jobs, or a -13.61 percent change in regional employment. The total number of employed positions (non-farm) in the ROI is estimated to be 43,955. A significant population reduction of 9.50 percent within the ROI would be anticipated as a result of this alternative. Of the approximately 125,000 people (including those residing on Fort Sill) that live within the ROI, 11,869 military employees and their dependents would no longer reside in the area following the implementation of Alternative 1. This would lead to a decrease in demand for housing, and increased housing availability in the region. This could lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes Soldiers, civilians, and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.19-6 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.19-6. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $215,529,994 (Local) - $325,203,883 (State)	- $239,587,524	- 5,325 (Direct) - 679 (Indirect) - 6,004 (Total)
Percent	- 9.66 (Total Regional)	- 9.22	- 13.66

The total annual loss in volume of direct and secondary sales in the region represents a -9.66 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 0.43 percentage points more than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, state tax revenues would decrease by approximately $14.63 million as a result of the loss in revenue from sales reductions, which would be $5.36 million more in lost state sales tax revenue that projected by the EIFS model. Regional income is projected by RECONS to decrease by 9.22 percent, slightly more than the 8.45 percent reduction projected by EIFS. While approximately 4,700 Soldier and Army government civilian positions would be lost within the ROI as a direct result of the implementation of Alternative 1, RECONS estimates another 611 military contract and service jobs would be lost, and an additional 679 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 6,004 jobs, or a -13.66 percent

change in regional employment, which would be 0.05 percentage points more than projected by the EIFS model.

When assessing the results together, both models predict similar economic impacts of the implementation of Alternative 1 would lead to a net reduction of economic activity within the ROI.

***Schools*.** Alternative 1 would lead to a significant reduction in enrollment, averaging a 10.6 percent drop across the ROI. Some schools would experience more than a 20 percent loss in enrollment. With the loss of state and Federal Impact Aid, this may affect their viability or force regional school consolidations.

Public Services. Police, Fire and Emergency services would be adversely affected by a significant reduction in local taxes throughout the ROI. The existing mutual aid agreements would not be expected to change, but it may increase frequency of requests for aid because of diminished capabilities.

Medical Services. Medical services would not be expected to have any significant change. Demand would continue for these services at reduced levels. Fort Sill does not anticipate significant adverse or beneficial impacts to public health and safety under the Proposed Action.

***Family Support Services*.** A reduction in permanent-party Soldiers could reduce demand on select Family support service providers on post. Demand would continue child care and other ACS programs available on Fort Sill. Off-post Family support services throughout the region would not likely experience a significant decrease in clients. Fort Sill does not anticipate significant adverse or beneficial impacts to Family support services under the Proposed Action.

Environmental Justice. As a result of the implementation of Alternative 1, Fort Sill does not anticipate a disproportionate adverse impact to minorities, economically disadvantaged populations, or children in the ROI. Fort Sill anticipates that job losses would be felt across economic sectors and at all income levels and spread geographically throughout the ROI. The proposed force reduction would not have disproportionate or adverse health effects on low-income or minority populations in the ROI. The racial and ethnic composition of the ROI is more diverse from that of the rest of the state. With the exception of Native Americans, all ethnic and racial groups are more prevalent in the ROI. At the statewide level, adverse impacts in the ROI represent a disproportionate adverse impact to Hispanic, Asian, and African Americans.

4.19.5 Hazardous Materials and Hazardous Waste

4.19.5.1 Affected Environment

Numerous maintenance activities, such as vehicle operation and maintenance, hospital services, and grounds maintenance, require the use and storage of regulated and non-regulated hazardous materials. Fort Sill has developed a Hazardous Materials and Waste Management Plan which prescribes responsibilities, policies, and procedures for managing hazardous materials and waste on post. The plan was written to ensure compliance with applicable federal, state, and local laws and regulations. Fort Sill's SPCC Plan addresses the prevention of unintentional pollutant discharges from the bulk storage and handling of petroleum products and other hazardous materials. The plans detail the specific storage locations, the amount of material in potential spill sites throughout Fort Sill, and spill countermeasures that must be taken to minimize hazards from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste. In addition, Fort Sill has incorporated hazardous waste reduction and pollution prevention into its hazardous waste management operations. Examples of hazardous wastes generated at the installation are waste paint, spent solvents, photographic waste,

contaminated fuel, battery waste, pharmaceutical waste, aerosols, alcohols, acids, pesticides, and paint thinners.

Fort Sill operates as a large-quantity generator under a single EPA identification number. Specific generators on post are managed as satellite accumulation points. Satellite accumulation points are areas located at or near the point of generation where 55 gallons (or less) of hazardous waste may be accumulated. The Environmental Quality Division operates a less-than-90-day lot where wastes are stored prior to transport to a Treatment, Storage, and Disposal Facility through a DRMO contractor. In keeping with Army policy, Fort Sill uses the Defense Reutilization and Marketing Service and the regional DRMO to transport its hazardous waste off post to a designated Treatment, Storage, and Disposal Facility for proper treatment and disposal or reuse and recycling.

There are only three regulated USTs on Fort Sill. All former USTs on post have been removed and are considered closed in accordance with the Oklahoma Corporation Commission, Petroleum Tank Division. All storage tanks located on Fort Sill must have either secondary containment and/or a leak detection monitoring system, along with spill plans for spill control and countermeasures.

The Fort Sill cantonment area has two Munitions Response Sites under the U.S. Army Military Munitions Response Program. The cantonment area was historically part of an active range from the construction of the installation in 1869 until 1960. Fort Sill is currently conducting remediation activities in heavily affected areas of the cantonment (Greene, 2012).

4.19.5.2 Environmental Consequences

No Action Alternative

There would be negligible impact anticipated under the No Action Alternative. Fort Sill would continue dispose of waste and store and manage hazardous materials in accordance with installation HWMP.

Alternative 1: Force Reduction (up to 4,700 Soldiers and Army Civilians)

Fort Sill anticipates temporary less than significant impacts with the increase in the volume of hazardous waste generated and hazardous material requiring storage. Deactivating units would turn in hazardous material (paints, cleaning solvents, pesticides etc.) for disposal to avoid transportation risks. Deactivating units would also turn in expired hazardous material that require disposal, as hazardous waste, to the appropriate locations as designated by the Fort Sill hazardous waste management office. More rapid implementation of the FRP and removal of temporary facilities could increase the hazardous and solid waste streams as components of some temporary structures, such as treated tent canvas, are disposed of as hazardous waste. Hazardous materials and waste SOPs and management practices would not change. The risk of RCRA or CERCLA violations or violations of Fort Sill's hazardous waste operations would not increase under the Proposed Action. Hazardous waste and materials would be managed in accordance with the installations HWMP and applicable regulations. Over the long-term, force reduction would result in the generation of less solid and hazardous waste produced.

4.19.6 Traffic and Transportation

4.19.6.1 Affected Environment

Fort Sill has 180 miles of roads, including 130 miles of paved roads and 50 miles of gravel roads. There are also about 300 miles of dirt range roads on the installation. The installation's road and street network is, for the most part, a grid system with a vast majority of the installation's roads and streets running north-south or east-west. There are six access gates

onto Fort Sill. Traffic volume through the three highest-volume gates contributes directly to the installation's two primary arterial routes. I-44 runs through the eastern portion of Fort Sill and east of the Lawton central business district. The Fort Sill, Oklahoma Traffic and Transportation Analysis – Projected Impact from the 2005 BRAC Recommendations estimated that daily traffic volume through the Fort Sill gates is approximately 24,554 vehicles. Average daily traffic volume on weekends and holidays through the gates is approximately 11,673 vehicles.

The Fort Sill area is served by the Lawton-Fort Sill Regional Airport, which is south of the City of Lawton and approximately 12 miles from Fort Sill. All flights are routed through the Dallas-Fort Worth airport in northern Texas, approximately 150 miles from Lawton.

The Lawton Area Transit System runs five routes in the greater Lawton Area. The Orange route operates in a circular pattern between the Lawton Central Business District and Fort Sill. Other than the bus lines and taxi cabs there are no other forms of public transportation that serve Fort Sill. Lawton area residents rely on personally owned vehicles as their primary means of transportation to work. Only about 13.6 percent of post personnel participate in carpools (USACE, 2008).

4.19.6.2 Environmental Consequences

No Action Alternative

Fort Sill anticipates long-term minor impacts to traffic and transportation under the No Action Alternative. Traffic volume on post would not change and the number of Soldiers, civilians, and dependents utilizing the Fort Sill transportation system would remain at current levels. Minor delays at ACPs during peak traffic hours would continue. Overall, LOS on major roadways and access points would remain acceptable.

Alternative 1: Force Reduction (up to 4,700 Soldiers and Army Civilians)

Fort Sill anticipates long-term minor beneficial impacts to traffic and transportation as a result of the implementation of Alternative 1. Traffic volume on post would decrease due to a reduced number of government and POVs and a decreased number of Soldiers and dependents utilizing the Fort Sill and surrounding community transportation systems. Traffic volume in the local community would decrease to a minor extent. Minor delays at major ACPs would decrease in duration.

4.19.7 Cumulative Effects

Region of Influence

The ROI for this cumulative impact analysis of Army 2020 realignment at Fort Sill covers all of Comanche County in the state of Oklahoma. Lawton, Oklahoma is the largest city within the ROI and residents make-up approximately 78 percent of the county's total population. The economy within Lawton is primarily centered on government, manufacturing, and retail trade industries while the rest of Comanche County is primarily rural. Fort Sill and the Wichita Mountains National Wildlife Refuge cover approximately 22 percent of the total land area for Comanche County. Fort Sill has long been a key component of the area economy. Government related activities are responsible for half the counties gross domestic product. Fort Sill has been in operation supporting the Army since 1869.

There are numerous planned or proposed actions within the ROI that have the potential to cumulatively add impacts to Army 2020 alternatives. These actions are either in progress or reasonably could be initiated within the next 5 years. A number of the Army's proposed projects have been previously identified in the installation's Real Property Master Planning Board and are programmed for future execution. A list of projects below presents some of the projects

which may add to the cumulative impacts of the implementation of Army 2020 realignment alternatives.

Fort Sill Projects (Past, Present, and Reasonably Foreseeable)

Stationing

After an influx of personnel due to the 2005 BRAC, Fort Sill underwent a restructure which resulted in a decrease in approximately 900 permanent party personnel. Recent Army garrison management decisions have led to some reductions in the Army civilian employee population at Fort Sill.

Military Construction and Operations and Maintenance

Since 2005 Fort Sill has seen a multitude of construction actions, most notably:

- BRAC Infrastructure Projects and Air Defense Artillery Training Facilities;
- Child Development Centers;
- Barracks complexes and renovations;
- Dining Facilities;
- Warrior Transition Unit Complex;
- Fire and Movement Range;
- Infantry Squad Battle Course Range;
- Twenty-Five Meter Range;
- Modified Record Fire Range; and
- UAS Runway.

Future anticipated construction actions include:

- Central Issue Facility;
- Air Defense Artillery Training Support Facility;
- Physical Fitness Facility;
- Chapel Complex;
- Reception Complex;
- FIRES Brigade Complex;
- Rail Deployment Facility;
- Mission Command Training Center;
- Terminal High Altitude Area Defense Training Facility;
- Multi-Purpose Machine Gun Range; and
- Modified Record Fire Range.

Other Agency (DoD and non-DoD) and Other Public/Private Actions (Past, Present, and Reasonably Foreseeable)

Non-Army actions occurring on Fort Sill include the construction of a new AAFES Shoppette with carwash and a separate dual food facility. Also the construction of the Armed Forces Reserve Center was recently completed. Fort Sill's on-post housing was privatized in 2008. Currently a new addition is under construction which will result in 432 new homes.

Actions within Comanche County include ongoing Local Government include improvements to roads, bridges, parks, treatment facilities, and water systems. In addition, more than 12 new

housing developments and several apartment complexes have recently been constructed across the ROI. Many of the local school districts are constructing new schools and/or upgrading existing facilities. As presented in Table 4.19-3, military dependents make up a significant portion of these schools' populations.

Lawton, Oklahoma is the only metropolitan area within the ROI. FY 2012 capital improvements for the city include a downtown revitalization project which will feature a large shopping center, a hotel convention center, a sports complex, and other amenities to encourage downtown living and recreation. Other projects proposed by the city include expansion and construction at the Lawton landfill, improvements to the airfield, and a new fire house in the expanding far western part of town. The city has also recently approved the construction of a large box store shopping center on the far west side of town.

Other recent changes within the ROI include the closure of two major call centers, the cancellation of the non-line of sight cannon project, and a decrease in hiring on Fort Sill in both government civilian and contract positions.

4.19.7.1 Environmental Consequences

Fort Sill anticipates a range of cumulative effects resulting from the implementation of the Proposed Action and alternatives. Cumulative impacts for each alternative are as follows:

No Action Alternative

Beneficial through significant but mitigable adverse cumulative impacts would be anticipated under the No Action Alternative. No changes in military authorizations, or local environmental conditions would be anticipated. Installation facility shortages and excesses would remain at their currently planned levels without additional stationing or force reductions. The Army would continue to implement some facilities reductions of outdated/unused facilities. Under the No Action Alternative, cumulative impacts to air quality, airspace, soil erosion, biological resources, wetlands, water resources, facilities, socioeconomics, energy demand and generation, land use conflict and compatibility, hazardous materials and hazardous waste, and traffic and transportation would be minor. Cumulative impacts under the No Action Alternative that would be more than minor are cultural resources and noise. Further discussion of these cumulative effects are presented below.

Cultural Resources. Future construction actions, outside of the context of Army 2020 actions, would be considered to have a less than significant potential impact to existing cultural resources. Activities on post are managed by the Fort Sill Cultural Resources Office which consults with the Oklahoma SHPO and the local Native American Tribes on actions that could potentially impact eligible cultural sites. Other projects within the ROI, such as the housing development complexes and downtown revitalization, could also inadvertently impact cultural resources or affect historic structures. Cumulatively, however, impacts would remain less than significant.

Noise. Off-post construction activities would also contribute to noise impacts within the ROI, but overall impacts to Lawton and other communities would be less than significant. The Army would continue to mitigate the impacts of its training to less than significant levels through scheduling of training events.

Alternative 1: Force Reduction (up to 4,700 Soldiers and Army Civilians)

Cumulative impacts as a result of the implementation of Alternative 1 range from beneficial impacts to significant adverse impacts to socioeconomics. As a result of Alternative 1, the Army anticipates beneficial to minor adverse cumulative impacts to air quality, airspace, noise, soil

erosion, biological resources, wetlands, water resources, facilities, energy demand and generation, land use conflict and compatibility, and traffic and transportation.

Noise. Noise impacts within the ROI from construction of housing developments and other Army proposed projects would be off-set by the reduction in training noise as a result of this alternative. Cumulative impacts within the ROI would be minor and a net benefit to noise within the ROI would be anticipated.

As a result of Alternative 1, the Army anticipates more than minor cumulative adverse impacts to the following VECs.

Socioeconomics. Regionally, off-post unemployment has risen 3.9 percent within the ROI from January 2008 to January 2012 (USDL, 2012). Actions, such as the completion of BRAC construction projects, the drawdown of government workers, and the closure of two large call centers in Lawton, Oklahoma have contributed to a decline in employment within the ROI. Nationally, unemployment has been trending lower since 2010. In April 2010, the national unemployment rate was 9.9 percent and as of September 2012 it was reported as 7.8 percent (USDL, 2012). Under Alternative 1, the loss of 4,700 Soldiers and Army civilian employees in conjunction with other reasonably foreseeable proposals would have a significant adverse impact to employment, income, regional population, and state and local county tax revenues. A force reduction, coupled with the increase of on-post housing would reduce the need for ready off-post housing, thereby further impacting local housing markets and the need for developments currently in construction within the ROI. The number of Soldiers living off post would also decrease also adding to a decreased demand for off-post housing within the ROI.

Cultural Resources. Future construction actions, outside of the context of Army 2020 actions, would be considered to have a less than significant potential impact to existing cultural resources. Activities on post are managed by the Fort Sill Cultural Resources Office which consults with the Oklahoma SHPO and the local Native American Tribes on actions that could potentially impact eligible cultural sites. Other projects within the ROI, such as the housing development complexes and downtown revitalization, could also inadvertently impact cultural resources or affect historic structures. Cumulatively, however, when considering the potential impacts of facilities demolition as a result of the implementation of Alternative 1, impacts would be projected to be significant but mitigable.

Hazardous Materials and Hazardous Waste. Temporary less than significant cumulative impacts to hazardous waste volumes are anticipated within the ROI. Both the installation and other entities pursuing new development or demolition activities within the ROI would follow applicable federal and state hazardous material and waste storage and disposal procedures to minimize impacts and environmental risks.

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4.20 FORT STEWART, GEORGIA

4.20.1 Introduction

Fort Stewart, located in southeastern Georgia, consists of approximately 280,000 acres of military training lands and built infrastructure (Figure 4.20-1). The installation has long supported armored/mechanized unit training and dismounted infantry unit training. Hunter Army Airfield is a sub-installation of Fort Stewart located 40 miles to the northeast of the installation boundary. Any BCT stationing actions described would take place within Fort Stewart proper; therefore, potential impacts to Hunter Army Airfield are not discussed.

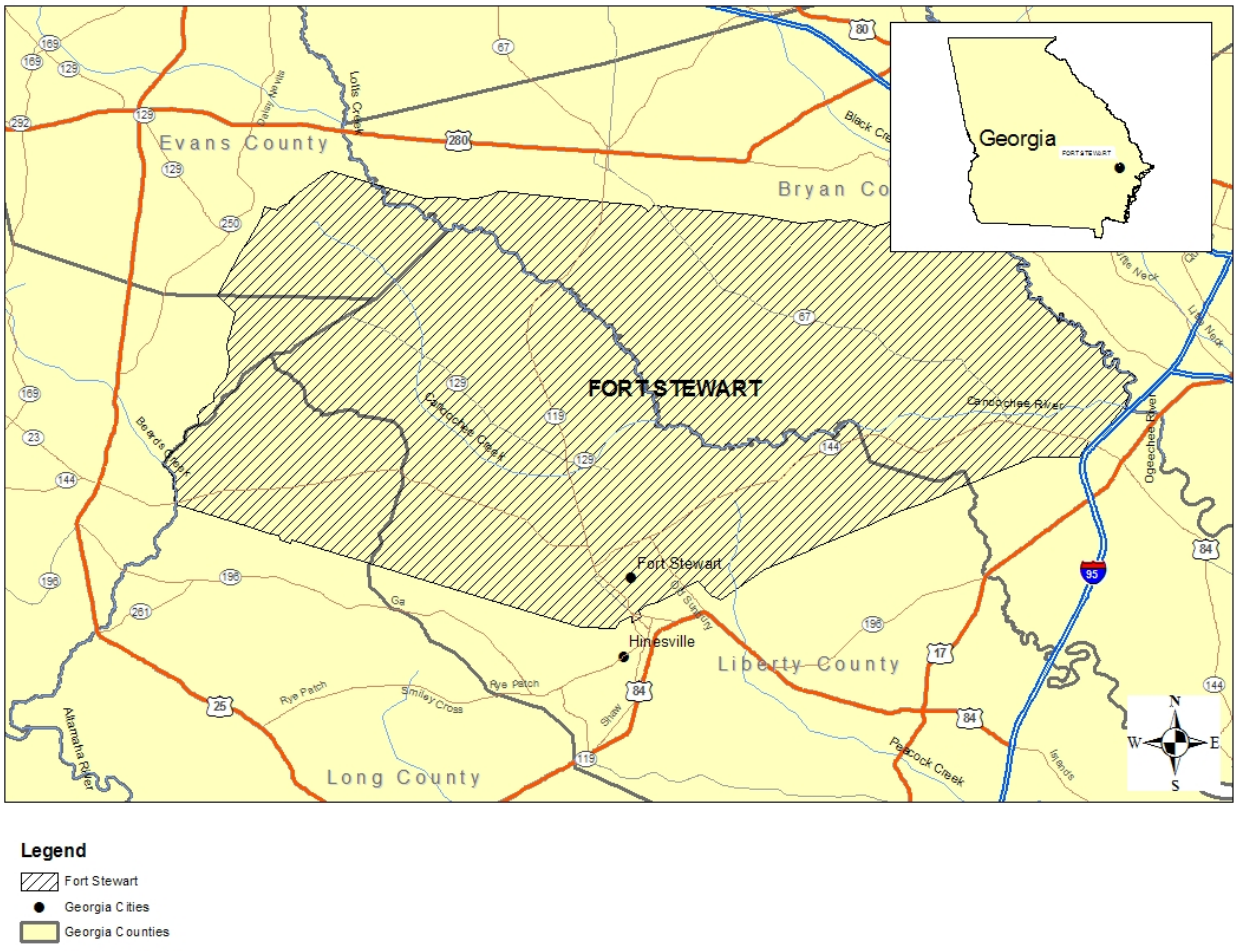

Figure 4.20-1. Fort Stewart

Major units of the 3rd Infantry Division, which is stationed at Fort Stewart, include two ABCTs, one IBCT (1/3, 1/3, 4/3 of the 3rd ID), a SUSBDE, combat support and service support units, and a CAB. Although the CAB is stationed at Hunter Army Airfield, it is discussed in this PEA in relation to the impacts of the CAB's training on Fort Stewart ranges and training lands. In addition to the resident units stationed at Fort Stewart, two to three Army Reserve or National Guard Brigades conduct their annual training on Fort Stewart each year.

Fort Stewart has a well-developed range and training land infrastructure that supports Abrams Tank, Bradley Fighting Vehicle, Aerial Gunnery, Artillery Live-Fire Training, other assorted live-fire training, maneuver training, individual, and team and collective tasks. Training land configuration allows for concurrent live-fire and maneuver training in separate sections of the

installation, each not interfering with the other. Coastal Georgia growth projections indicate that the current population would double in this region over the next 10 years. Fort Stewart works closely with multiple local communities to minimize potential conflicts with the military mission and reduce encroachment risks.

4.20.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, Fort Stewart does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 8,000 Soldiers and Army Civilians) or Alternative 2 (Installation gain of up to 3,000 Soldiers). Fort Stewart does anticipate a significant adverse socioeconomic impacts to economic activity including significant impacts to sales volume, income, employment, and population as a result of the implementation of Alternative 1. Under Alternative 2, Fort Stewart would experience a significant increase in population within the ROI. Table 4.20-1 summarizes the anticipated impacts to VECs from each alternative.

Table 4.20-1. Fort Stewart Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 8,000	Alternative 2: Growth of up to 3,000
Air Quality	Minor	Beneficial	Minor
Airspace	Minor	Negligible	Minor
Cultural Resources	Negligible	Minor	Minor
Noise	Negligible	Beneficial	Minor
Soil Erosion	Minor	Negligible	Less than Significant
Biological Resources	Negligible	Beneficial	Minor
Wetlands	Minor	Beneficial	Minor
Water Resources	Minor	Negligible	Minor
Facilities	Negligible	Minor	Less than Significant
Socioeconomics	Negligible	Significant	Beneficial
Energy Demand and Generation	Negligible	Beneficial	Minor
Land Use Conflict and Compatibility	Negligible	Beneficial	Minor
Hazardous Materials and Hazardous Waste	Negligible	Minor	Minor
Traffic and Transportation	Minor	Beneficial	Less than Significant

4.20.2 Air Quality

4.20.2.1 Affected Environment

The ROI for Fort Stewart includes portions of five counties—Bryan, Evans, Liberty, Long, and Tattnall. The City of Hinesville and Liberty County are adjacent to the cantonment area along the southern boundary of the post. The City of Pembroke and Bryan County border Fort Stewart

to the north. The cities of Glennville and Richmond Hill lie to the west and east of post boundaries, respectively. The bordering counties are in attainment for EPA's NAAQS.

Fort Stewart is a major source of air pollutants and maintains a Title V Operating permit. Primary stationary sources include boilers, generators, fuel storage and dispensing areas, and surface coating operations. Since Fort Stewart is located in attainment areas there is no requirement to conduct a conformity analysis. The CAA's PSD requirements are not anticipated to be triggered by the installation's activities.

4.20.2.2 Environmental Consequences

No Action Alternative

No change to the type or the frequency of training events would occur. Although there would continue to be minor short- and long-term fugitive dust impacts from training, these impacts would not exceed threshold levels. Permit conditions would continue to be monitored and met, but no changes to or increases in emission sources are anticipated, other than those mandated by maintenance, replacement, or elimination of sources as they age and/or are removed from service.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated beneficial impact to air quality resulting from the reduction in unit training events and the accompanying reduction in stationary and mobile emission sources. Conditions identified in air permits would continue to be monitored and may require changes as a result of this alternative. Specifically, the permit may require modification to reflect the lowered emission levels resulting from less combustion and generation of NAAQS pollutants and HAPs associated with the reduction in the number of Soldiers engaged in military training. In addition, there would be less fugitive dust generated from fewer unit training events.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated minor impact on air quality. An increase in emissions from mobile and stationary sources would result from the stationing of additional Soldiers and their Families. The increased HAPs, CAPs, emissions, and fugitive dust would be derived from military vehicles and generators supporting training events, but would not cause Fort Stewart to exceed the limits of its Title V permit or cause any change in its attainment status. This determination was made in 2008 studies carried out to analyze Fort Stewart's potential for the stationing of a BCT, which would have placed approximately 3,400 additional Soldiers at Fort Stewart (Fort Stewart, 2008a). These studies indicated the installation could support the action with minimal impacts to air quality. That additional BCT was not stationed at Fort Stewart.

4.20.3 Airspace

4.20.3.1 Affected Environment

Fort Stewart has 386 square miles of FAA-designated SUA, from the ground surface to 29,000 feet above MSL. The installation may activate the restricted airspace from 0600 to 2400 local daily for area R3005 A, B, D, E; and 0600 to 0300 local daily for area R3005 C, with other times available by Notice to Airmen 24 hours in advance (Fort Stewart, 2005). In addition, by Letter of Agreement, R3005 A-E may be activated to 45,000 feet with 48 hour advance notice to FAA Jacksonville Center.

4.20.3.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative would not produce any conflicts with overlying restricted airspace, as no proposed change to existing conditions would occur.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have negligible impacts to airspace. The installation would require less activation of the SUA in support of live-fire training activities. Aviation and UAS units would continue to require airspace to support training, but at a lower utilization level. Fort Stewart's training activities would still require the activation of the existing SUA but with less frequency.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated minor adverse impact to airspace. The number and type of aircraft utilizing the SUA would not change substantially from the existing condition and additional airspace would not be required to support the additional ground units; however, implementation of Alternative 2 would result in an increase in scheduling, activation, and utilization of the existing SUA. The increased operations could cause some minor impacts to air traffic flow within the National Airspace System around Fort Stewart. Adhering to the existing airspace management and scheduling operations should minimize potential conflicts and impacts, despite additional time and use demands for the SUA.

4.20.4 Cultural Resources

4.20.4.1 Affected Environment

The affected environment for Fort Stewart encompasses the legal boundaries of the installation. The Fort Stewart region has been occupied for at least 12,000 years by Native Americans, Europeans, and the military (Fort Stewart, 2008b). Most prehistoric sites at Fort Stewart consist of habitation sites, base camps, small villages, seasonal use camps, hunting stations, and isolated artifact scatters. Most historic period sites at Fort Stewart consist of homesites, agri-industrial related activities, naval stores production and collection sites, and isolated artifact scatters.

Approximately 175,000 of the 280,000 acres of Fort Stewart have been surveyed for cultural resources (Fort Stewart, 2008b). As a result of these archaeological surveys, 3,608 archaeological sites have been recorded at Fort Stewart, of which 43 have been recommend eligible and 162 potentially eligible for the NRHP. In addition to these archaeological sites, 60 historic period cemeteries, one sacred site (Lewis Mound) and two TCPs (Taylors Creek and Pleasant Grove Cemeteries) have been identified. Regarding historic buildings and structures, Fort Stewart has conducted an entire survey and evaluation of all buildings and structures built before 1990 (to include Cold War Era buildings eligible under Criteria G of the NRHP). As a result of this building survey, five buildings that have been determined eligible for the NRHP have been identified at Fort Stewart (Glisson's Mill Pond Store and four Fire Towers). Each year, as buildings approach the 45 year mark, they are reassessed for eligibility.

A revised Programmatic Agreement between the 3rd Infantry Division (Mechanized), Fort Stewart, and the SHPO was executed in 2011 and provides a streamlined process for Section 106 of the NHPA compliance by the Army at Fort Stewart (Fort Stewart, 2008b). The Programmatic Agreement states that Fort Stewart will conduct archaeological surveys (if not previously conducted) to identify any historic properties that could be affected by a project,

activity, or undertaking. It also provides a listing of undertakings excluded from evaluation under Section 106 (e.g., undertakings in severely disturbed special use and bivouac areas, most areas within the cantonment, and impact areas that are highly likely to be contaminated with UXO). For all undertakings that are determined by cultural resource staff to have no adverse impacts upon historic properties, individual consultations with the SHPO is not required. If the undertaking has the potential to adversely affect historic properties, consultation per 36 CFR 800 is required. The revised Programmatic Agreement also reduces the requirement for archaeological surveys within areas of low potential for cultural resources that also contain elevated risk of UXO.

4.20.4.2 Environmental Consequences

No Action Alternative

Impacts to cultural resources under the No Action Alternative would be negligible. Activities with the potential to affect cultural resources are monitored and regulated when anticipated through a variety of preventative and minimization measures.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated minor adverse impact to cultural resources. Removal of temporary facilities vacated by departing units would have a very low potential for adverse impacts to archeological resources due to the minimal amount of ground disturbance associated with such actions. Removal of outdated and under-utilized infrastructure has the potential to affect historic structures, but would be conducted in accordance with the current Programmatic Agreement. If an undertaking does not fall within the Programmatic Agreement and has the potential to adversely affect historic properties, consultation with the SHPO would occur, per 36 CFR 800, as required. Currently, few historic structures have not been previously mitigated for future demolition and modification via the Programmatic Agreement, stand-alone and group Memorandum of Agreements, Memorandum of Understandings, or other installation/SHPO agreements. Thus, there is a low potential for potentially eligible historic structures to be adversely affected as a result of this action.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have minor impacts to cultural resources. Measures are in place to accommodate training while minimizing potential adverse impacts to cultural resources. The types of training conducted by the additional Soldiers would not change, although some training areas on Fort Stewart might experience more frequent or intense use compared with current baseline conditions. The Programmatic Agreement addresses consultation requirements for anticipated training impacts, and Fort Stewart would continue to follow these procedures. Large portions of Fort Stewart are forested and require the use of tank trails and low water crossings. Impacts to cultural resources from mounted vehicular training or from off-road or foot traffic in these locations is unlikely, as this type of training is only conducted in select training areas. Increased use of established ranges, however, has the potential to lead to the loss of some cultural resources through associated small-scale ground disturbance.

Under the terms of the revised Fort Stewart Programmatic Agreement, "routine cross-country passage of all military field vehicles" is exempt from Section 106 Review. This does not, however, exempt protection of known NRHP-eligible sites and/or cemeteries that may be affected by this action. Fort Stewart employs one or more of the following protective measures: fencing, signage, painted boundaries, and seibert stakes, all of which are identified through various military/civilian training opportunities, media outlets, and posting of appropriate notices. As a result, impacts from cross-country maneuver are anticipated to be negligible.

Any increase in training has the potential to further-limit access to the installation's 60 historic cemeteries, two of which are TCPs, and all of which are routinely visited by the public. It would not be anticipated that historic buildings would need to be demolished or reconfigured to accommodate more Soldiers as a result of this alternative.

4.20.5 Noise

4.20.5.1 Affected Environment

According to the 2005 JLUS all noise generated from small arms weapons fire is effectively contained on installation lands and maneuver areas and thus, do not pose compatibility issues with off-post residential communities (Fort Stewart, 2005). Noise associated with LUPZ is experienced at off-post locations (and sometimes can cause annoyance in these areas) affecting the City of Pembroke and Bryan County to the north and the City of Hinesville and Liberty County to the south. NZ II, which on Fort Stewart is caused by large caliber weapons firing, extends beyond the installation boundary and north into Bryan County. NZ III is fully contained within the installation, and maneuver noise is not currently an issue with respect to local communities (Fort Stewart, 2005).

4.20.5.2 Environmental Consequences

No Action Alternative

Negligible impacts from noise are anticipated under the No Action Alternative. The acoustic environment of Fort Stewart would continue to be affected by small- and large-caliber weaponry, artillery, and aircraft over-flight. Other activities, such as ground maneuver training and exercises resulting in noise created by personnel and vehicles, would continue to contribute noise on Fort Stewart, to the same levels and intensity as historically experienced.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated beneficial impact to the noise environment, with a reduction in the frequency of noise-generating events. Existing ranges would still be utilized for firing the same types of weapons systems and conducting the same types of training. Fort Stewart's remaining BCTs would also continue to conduct maneuver and live-fire training in the field; however, there would be a reduction in the frequency of noise generating training events, which would be reduced roughly in proportion to the decrease in the number of Soldiers stationed at the installation. A reduction of up to 8,000 Soldiers would not change the intensity or type of noise-generating activities. With less frequent firing events there would be an anticipated reduction in the potential for noise complaints from the public and community residents that live in areas bordering the installation. Aviation units on Fort Stewart would not be impacted by these decisions; therefore, the current frequency and training activities of aviation units, a major contributor of noise at the installation, would not be anticipated to change.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated minor impact on the noise environment on the installation and surrounding communities due to the stationing of up to 3,000 Combat/Combat Support Soldiers. Noise modeling conducted in 2008 (in anticipation of potentially acquiring a new BCT of 3,400 Soldiers) indicated that additional stationing would not result in major changes to noise levels for sensitive receptor populations. Given that there are no new types of activities that would occur as a result of stationing under Alternative 2, just an increase in the frequency of existing noise generating activities, only minor impacts are anticipated to occur as a result of implementing this alternative.

4.20.6 Soil Erosion

4.20.6.1 Affected Environment

Fort Stewart is a relatively flat, coastal landscape predominantly made up of poorly drained loamy sand and sandy soil, riparian, and other wetland areas. The principal cause of soil erosion is from maneuver of tracked and wheeled vehicles on already disturbed range areas; however, over the past decade, Fort Stewart has constructed many low water crossings to reduce impacts on ranges where vehicles have historically traversed streams and wetland areas on traditional dirt tank trails. Fort Stewart has many mapped wetland areas crucial for training for potential low water crossings. Fort Stewart has also implemented road infrastructure improvements that have addressed erosion and flooding issues in the training area, which has improved maneuverability and access to ranges.

4.20.6.2 Environmental Consequences

No Action Alternative

Minor adverse impacts are anticipated under the No Action Alternative. Fort Stewart would continue its infantry and mechanized training, to include impacts to soils from removal of or damage to vegetation, digging activities, ground disturbance from vehicles, and ammunition or explosives used in training events. The installation's ITAM program conducts monitoring, rehabilitation, and maintenance and repair on areas of high use such as drop zones, artillery firing positions, observation points, and ranges.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated negligible and potentially beneficial long-term impact to soils. This alternative includes the demolition of vacated facilities no longer needed, for which no other user can be identified. Demolition of facilities could result in short-term adverse impacts to soils from the temporary exposure of bare soils to rain, water, and wind erosion; however, soils would be stabilized with seeds, matting, and other erosion control measures following demolition. BMPs for construction and demolition would also be utilized to stabilize soils and prevent soil erosion on work sites. Overall, there would be anticipated beneficial long-term impacts to soils from reduced training levels. A reduction in training would provide more opportunities for land rehabilitation efforts and natural rest and recovery of the landscape. This would further aid in the lessening of soil erosion and sedimentation.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated less than significant impact to soils. Construction to facilitate the additional Soldiers would be required. Construction would result in temporary, minor adverse impacts to soils from land clearing and site leveling. Exposed soils would become more susceptible to erosion, and declines in soil productivity (i.e., the capacity of the soil to produce vegetative biomass). Training of the additional ground units would also increase soil impacts and surface disturbance from unit maneuvers. With the potential addition of another maneuver battalion, engineer units and other support units to a BCT, more vehicles would impact roads in Fort Stewart's training areas and maneuver corridors; therefore, a greater amount of sedimentation would be anticipated to occur in the regional surface waters. Fort Stewart's ITAM program would continue to monitor training lands for disturbance, and would plan and implement rehabilitation and erosion control measures in areas of high use.

4.20.7 Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species)

4.20.7.1 Affected Environment

Fort Stewart is home to 10 special status plant species and 21 special status fauna species (Fort Stewart, 2007). Among these species, six ESA-listed fauna species are currently recorded as occurring on the installation. Table 4.20-2 lists the threatened or endangered species found on Fort Stewart.

Table 4.20-2. Threatened or Endangered Species Found On Fort Stewart Federally-Listed or Listed by the State of Georgia

Common Name	Scientific Name	Federal Status	Georgia State Status
Plants			
Purple honeycomb head	*Baldunia atropurpurea*	-	Rare
Georgia plume	*Elliottia racemosa*	-	Threatened
Green-fly orchid	*Epidendrum magnolia*	-	Unusual
Dwarf witch-alder	*Fothergilla gardenia*	-	Threatened
Michaux's spider orchid	*Habenaria quinqueseta*	-	Threatened
Pond spice	*Litsea aestivalis*	-	Rare
Crestless plume orchid	*Pteroglossaspis ecristata*	-	Threatened
Hooded pitcher plant	*Sarracenia minor*	-	Unusual
Swamp buckthorn	*Sideroxylon thornei*	-	Rare
Silky camellia	*Stewartia malacodendron*	-	Rare
Mammals			
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	-	Rare
West Indian manatee	*Trichechus manatus*	Endangered	Endangered
Birds			
Bachman's sparrow	*Aimophila aestivalis*	-	Rare
Bald eagle	*Haliaeetus leucocephalus*[1]	*	Threatened
Wood stork	*Mycteria americana*	Endangered	Endangered
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Endangered
Swallow-tailed kite	*Elanoides forficatus*	-	Rare
Peregrine falcon	*Falco peregrinus*	-	Rare
Southeastern kestrel	*Falco sparverius paulus*	-	Rare
Least tern	*Sterna antillarum*	-	Rare
Reptiles and Amphibians			
Frosted flatwoods salamander	*Ambystoma cingulatum*	Threatened	Threatened
Spotted turtle	*Clemmys guttata*	-	Unusual
Eastern indigo snake	*Drymarchon couperi*	Threatened	Threatened
Gopher tortoise	*Gopherus polyphemus*	Candidate	Threatened
Southern hognose snake	*Heterodon simus*	-	Threatened
Diamondback terrapin	*Malaclemys terrapin*	-	Unusual
Striped newt	*Notophthalmus perstriatus*	Candidate	Threatened

Common Name	Scientific Name	Federal Status	Georgia State Status
Mimic glass lizard	*Ophisaurus mimicus*	-	Rare
Gopher frog	*Rana capito*	-	Rare
Fish			
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered	Endangered
Invertebrates			
Say's spiketail	*Cordulegaster sayi*	-	Threatened

[1]As of 8 August 2007, the Bald Eagle is no longer afforded protection under the ESA; however, it is protected under the Bald and Golden Eagle Protection Act (Eagle Act) and the MBTA. The Eagle Act is the primary law protecting eagles and protection is very similar to the ESA.

Fort Stewart has an active forestry program, one of the largest in DoD. The forestry program is responsible for timber thinning operations and regular application of prescribed fire on live-fire ranges and training lands. The installation contains Georgia's largest remaining stand of longleaf pine forest.

4.20.7.2 Environmental Consequences

No Action Alternative

Negligible adverse impacts would occur at Fort Stewart under the No Action Alternative. Fort Stewart would continue to adhere to its existing resource management plans and to further minimize and monitor any potential impacts. Units are briefed prior to each training event regarding sensitive areas on post, such as protected species habitat, and what is and is not allowed within certain areas, such as within the protective buffer surrounding individual RCW cavity trees. Historical use of training areas and ranges indicate unit compliance with these restrictions and continued compliance is anticipated. Range capabilities and timber management activities on Fort Stewart are ongoing and would continue under the No Action Alternative in accordance with the installation's timber harvest priority list. Most prescribed harvest activities are thinnings carried out to support troop training, endangered species management, and forest health.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated beneficial impact to biological resources. Scheduling conflicts for training area access to conduct resource monitoring and management activities would be reduced. Proactive conservation management practices (e.g., application of prescribed fire, restoration of longleaf pine-wiregrass ecosystems) would be more easily accomplished with reduced scheduling of training activities.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have minor adverse impacts to biological resources. The potential increase in the number of Soldiers would be less than 20 percent above current stationing levels. While this moderate force augmentation would increase traffic in the training lands and ranges, it would not cause significant degradation or destruction of threatened or endangered species or rare species habitats. Fort Stewart proactively manages its conservation programs within the installation's training areas; however, access to training lands and ranges for the purpose of threatened or endangered species monitoring and habitat management would become more difficult with increased throughput. Access is essential to conduct management actions (prescribed burning, etc.) and to conduct monitoring in order to

demonstrate that populations of threatened or endangered species are stable or increasing. Range managers and natural resource management staff would more closely coordinate access to training areas for species management activities to ensure adequate access is obtained. The anticipated effects of gaining up to 3,000 Soldiers would be minor as these Soldiers would train in the same manner as Soldiers currently stationed on Fort Stewart, though frequency of training would increase. Fort Stewart would continue to ensure that management and monitoring activities are conducted even if training activities must be adjusted.

4.20.8 Wetlands

4.20.8.1 Affected Environment

Fort Stewart contains approximately 91,000 acres of wetlands spread across 280,000 acres. Wetlands on Fort Stewart are generally high functioning with healthy communities of hydrophytic vegetation that are found throughout the installation. Wetlands on Fort Stewart support populations of aquatic, semi-aquatic, and terrestrial animals, including some of the threatened and endangered species in Table 4.20-2 (Fort Stewart, 2007). Fort Stewart has implemented an aggressive mitigation program in order to offset wetland impacts. These projects include wetland enhancement and wetland restoration projects on large-scale areas that provide higher quality mitigation than smaller patchwork single permit mitigation products (Fort Stewart, 2007). Fort Stewart also maintains a proactive program to identify and remedy problematic points of impaired hydrology, severe siltation, and other threats to water quality in wetlands and natural waterways.

4.20.8.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative would have a minor adverse impact to wetlands on Fort Stewart. Wetlands impacts from projects already under construction (or for which NEPA is complete and construction pending) have been assessed and, if required, appropriate mitigation and permitting have occurred. Additionally, training, personnel operations, and routine maintenance and monitoring activities on Fort Stewart would continue to occur, resulting in minimal impacts to wetlands. Impacts are minimized by BMPs and regular maintenance of roads, ranges, training lands, and developed areas. Vehicle traffic through wetlands is restricted and activities in wetland restoration areas are monitored to ensure restoration is not compromised.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated beneficial impact to wetlands. A reduction in force at Fort Stewart would mean tank roads, ranges, and training areas would be less utilized. Construction projects carrying unavoidable wetland impacts would also be fewer. Less vegetation would be denuded and less sediment would run off into wetlands to impair their ecological function. As such, the loss or degradation of wetland systems would occur less frequently or to a decreased extent.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have a minor impact to wetlands. Training activities in areas adjacent to wetlands would increase, resulting in an increased potential for erosion and sedimentation into wetlands located along existing roads, ranges, and maneuver lands. An increase in construction would also occur, resulting in a probable increase of unavoidable wetland impacts. If it appears that wetland impacts are unavoidable, the appropriate level of permitting and mitigation would be obtained prior to the training event or construction action.

4.20.9 Water Resources

4.20.9.1 Affected Environment

Surface Water. Four watersheds occur within Fort Stewart's boundaries: the Altamaha, Canoochee, Lower Ogeechee and Ogeechee Coastal watersheds. Most of Fort Stewart is in the Canoochee River watershed. The Canoochee River traverses from the northwest corner to the eastern side of the installation with about 30 miles of the river located inside Fort Stewart's boundary. The installation has about 265 miles of freshwater rivers and streams and an additional 12 miles of brackish water systems. Existing impairments to surface water quality include both point sources and nonpoint sources. The most common point sources are municipal or industrial activities and WWTPs. The NPDES permit, required under the Georgia Water Quality Act and Georgia Erosion and Sedimentation Control Act, regulates the discharge of point source pollutants from industrial activities and construction projects within both the garrison and training areas. Nonpoint sources in the region include stormwater runoff from urban areas, agricultural, construction, range training activities, golf course irrigation, and forest timber harvesting. The Georgia NPDES MS4 permit regulates the nonpoint source discharges.

Water Supply. Fort Stewart obtains its potable water from groundwater within the Floridan aquifer. The Georgia Department of Natural Resources Environmental Protection Division has identified Fort Stewart as one of the top ten water users in the southeastern region of Georgia (Fort Stewart, 2007). Fort Stewart is implementing water conservation measures, to reduce water withdrawals; however, this is being done strictly as a conservation measure and not due to a dwindling of aquifer capacity or permitted withdrawal capacity. Fort Stewart has an adequate withdrawal capacity to support additional growth.

Wastewater Treatment. The installation is tied into and utilizes the Hinesville WWTP. The Hinesville WWTP will be upgraded to handle additional capacity in 2013, while also meeting reduced NPDES permit limits set by the Georgia Environmental Protection Division.

4.20.9.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative would have minor adverse impacts to water resources. No change from existing conditions would occur and all construction, operation, and maintenance projects already under way have obtained the NPDES permit and other applicable permits and are operating in adherence to their guidance. Training activities would continue, both on ranges and training lands, with adverse impacts mitigated via the ITAM land rehabilitation program.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated beneficial impact to water resources. A loss of up to 8,000 Soldiers would reduce traffic in Fort Stewart's training areas, roads, and ranges, decreasing the chance of potential surface water impacts. The demand for potable water would also be diminished, and as a result of the implementation of Alternative 1 would create additional treated wastewater capacity for other uses at the installation.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated minor impact to water resources, as discussed below.

Surface Water. Minor construction would occur as a result of this alternative, and its potential impacts managed through adherence to existing NPDES and other permits. An increase in training would result in an accompanying increase in the frequency and intensity of usage of

existing road, trail, and training areas. This could lead to increased sedimentation and surface water impacts attributable to soils compaction, increased vegetation loss, and increased sheet flow during rain events. Implementation of existing ITAM land rehabilitation measures would prevent these potential impacts from reaching a level of significance.

Water Supply. Potable water capacity at Fort Stewart is approximately 4.99 mgd and the estimated existing level of use is 2.7 mgd, leaving 2.3 mgd in excess. Based on the average of 100 gpd of potable water use per person it is anticipated that up to 3,000 additional Soldiers would increase potable water demand by up to approximately 300,000 gpd, a demand well within the 2.3 mgd potable water excess. Even when considering the water consumption of all dependents that could accompany these Soldiers, and a total consumption of another 456,000 gpd if they were all to live on post, there would still be adequate water supply. As such, this level of growth would not adversely impact Fort Stewart's water supply. Fort Stewart is currently using only approximately 50 percent of its water supply and is currently implementing water resource conservation measures to consume less potable water and to ensure adequate resources in the future.

Wastewater Treatment. Fort Stewart is allocated 3.79 mgd of wastewater and plans to expand its wastewater treatment capacity in 2013. Current use is 2.15 mgd, which would allow for an additional 1.35 mgd to be treated. Based on an average daily use of 109 gpd per person, it is anticipated that an increase of up to 3,000 Soldiers and their Family members would increase wastewater influx by a maximum of 824,000 gpd, well within the permitted limits and not exceeding the WWTP's treatment capacity.

4.20.10 Facilities

4.20.10.1 Affected Environment

Fort Stewart has a well-developed cantonment area with barracks, motorpools, administrative buildings, and gymnasiums, among other facility types. Housing facilities are provided through the RCI, using both public and private funding to meet Army housing requirements. Fort Stewart training facilities includes a well-developed range infrastructure.

4.20.10.2 Environmental Consequences

No Action Alternative

Impacts to facilities would be negligible under the No Action Alternative. Fort Stewart's current facility shortfalls have been prioritized and are seeking or have received Army funding. The installation would continue to implement the Army's FRP at Fort Stewart. Environmental analyses of the projects that result from these programs are conducted prior to implementation.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated minor impact on facilities. An increase in the FRP and facilities demolition at Fort Stewart would occur as a result of the implementation of Alternative 1. Older, less efficient facilities nearing the end of their life-cycle would be demolished to save the Army money on maintenance and energy requirements. Facility usage and availability for the remaining population would not be affected.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated less than significant impacts to facilities. Increased Soldier strength of up to 3,000 would be reflected through increased usage throughout the cantonment area. The Real Property Master Plan would require modifications to allow for implementation of this alternative. Some additional construction of facilities would be

needed to support new Soldiers stationed at Fort Stewart. Some of these facilities would include a battalion headquarters facility, company operations facility, motorpool, and barracks. These facilities have been identified as garrison facility shortfalls by installation master planners. An assessment of range infrastructure availability to support additional Soldiers would also be needed, and the results of this assessment included in the next iteration of the Real Property Master Plan. Housing shortfalls would mean that many of the additional Soldiers would need to live in off-post housing.

4.20.11 Socioeconomics

4.20.11.1 Affected Environment

Fort Stewart is located primarily in Liberty County and Bryan County, but also extends into smaller portions of Evans, Long, and Tattnall counties. Fort Stewart Military Reservation includes approximately 280,000 acres, making it the largest military installation in the eastern U.S. The ROI consists of Liberty, Bryan, Evans, Long, and Tattnall counties.

Liberty County, which contains the City of Hinesville adjacent to the installation, is the county that would be most affected by Army stationing actions. Fort Stewart's population and workforce have long been an essential element of the demography and economy of Liberty County. Socioeconomic impacts may be felt to a lesser extent within the counties of Tattnall, Bryan, Long, and Evans; this lesser impact is anticipated due to their distance from the main cantonment area.

Population and Demographics. The Fort Stewart population is measured in three different ways. The daily working population is 18,647, and consists of full-time Soldiers and Army civilians working on post. The population that lives on Fort Stewart consists of 9,028 Soldiers and an estimated 8,335 dependents, for a total resident population of 17,363. Finally, the portion of the ROI population related to Fort Stewart is 24,240 and consists of Soldiers, civilian employees, and their dependents living off post.

The ROI county population is approximately 146,000. Compared to 2000, the 2010 population increased in Liberty, Bryan, Evans, Long, and Tattnall counties (Table 4.20-3). The racial and ethnic composition of the ROI is presented in Table 4.20-4.

Table 4.20-3. Population and Demographics

Region of Influence Counties	Population 2010	Population Change 2000-2010 (Percent)
Liberty	65,000	+ 3.0
Bryan	30,000	+ 29.1
Evans	11,000	+ 4.8
Long	15,000	+ 40.4
Tattnall	25,000	+ 14.4

Table 4.20-4. Racial and Ethnic Composition

State and Region of Influence Counties	Caucasian (Percent)	African American (Percent)	Native American (Percent)	Hispanic (Percent)	Asian (Percent)	Multiracial (Percent)	Other (Percent)
Georgia	56	30	3	9	<1	2	<1
Liberty	43	41	0	10	2	3	1
Bryan	78	14	0	4	2	2	0
Evans	59	29	0	13	1	1	10
Long	62	25	0	12	0	1	0
Tattnall	60	29	0	10	0	1	0

Employment, Income, and Housing. Compared to 2000, the 2009 employment (private nonfarm) increased in Liberty, Bryan, Evans, and Long counties. Employment decreased in the State of Georgia and Tattnall County between 2000 and 2009 (Table 4.20-5). Employment, median home value and household income, and poverty level data are presented in Table 4.20-5.

Table 4.20-5. Employment, Housing, and Income

State and Region of Influence Counties	2009 Total Nonfarm Employment (Employees)	Employment Change 2000-2009 (Percent)	Median Home Value 2005-2009 (Dollars)	Median Household Income 2009 (Dollars)	Population Below Poverty Level 2009 (Percent)
Georgia	3,410,505	- 2.1	160,100	47,469	16.60
Liberty	13,049	+ 37.5	110,000	41,275	17.30
Bryan	5,710	+ 81.2	180,800	58,092	12.10
Evans	3,771	+ 4.4	81,000	30,513	27.90
Long	385	+ 75.0	80,800	37,358	23.00
Tattnall	2,698	- 10.9	77,300	31,894	27.60

Schools. According to the 2010 Fort Stewart Command Data Summary, Fort Stewart educated 606 students in grades kindergarten through 6th grade in on-post DoD schools, while 4,188 students in those grades attended off-post schools within Liberty, Long, Evans, and Bryan counties (no students attended schools in Tattnall County). DoD schools on post include Brittin Elementary, Diamond Elementary, and Kessler Elementary Schools. Fort Stewart sends students in grades 7-8 off post to Midway Middle School, located about 10 miles away from Fort Stewart and Hinesville. All students in grades 9-12 attend local high schools off post. The U.S. Department of Education administers federal funding to these off-post schools via the Federal School Impact Aid program. This program was established in 1950 to assist local school districts that have lost property tax revenue due to the presence of tax-exempt federal property, such as Fort Stewart, or that have experienced increased expenditures due to the enrollment of federally-connected children. This aid resulted in Liberty, Long, Evans, and Bryan counties receiving Federal School Impact Aid funds totaling just over $10.75 million in 2010.

Public Health and Safety Services

On post, the Directorate of Emergency Services commands the Military Police Units, the Fort Stewart Fire Department, and the Post Safety Office. This directorate ensures unity of effort among Fort Stewart emergency services to provide a safe and secure environment within which to work, train, live, and play. They consist of the following:

- **Law Enforcement Services.** The Fort Stewart Military Police oversee police operations, patrol installation property, provide ACP/gate protect life and property, conduct investigations, regulate traffic, provide crowd control, and perform other public safety duties. City, county, and state police departments provide law enforcement in the ROI.
- **Fire and Emergency Services**. The Fort Stewart Fire Department responds to emergencies involving structures, facilities, transportation equipment, hazardous materials, and natural and man-made disasters, and directs fire prevention activities; and conducts public education programs. Fire prevention is another service provided and includes providing fire safety advice and insuring that structures are equipped with adequate fire precautions to ensure that in the event of fire, people can safely evacuate the premises unharmed.
- ***Health Facilities/Services.*** Winn Army Community Hospital and Lloyd C. Hawks Troop Medical Hospital services include audiology/speech pathology, dermatology, dietetics, emergency services, family medicine, internal medicine, obstetrics, occupational therapy, ophthalmology, optometry, orthopedics, otolaryngology, pediatrics, physical therapy, psychiatry, surgery, podiatry, psychology, social work, and substance abuse. Clinics provide health services for Active Duty and retired military personnel and their Families on Fort Stewart. Dental services are also available at three dental clinics on post. These facilities service all Active Duty personnel and their dependents, as well as retirees and their dependents. Off post, Liberty Regional Medical Center in Hinesville provides the nearest health care facility (Fort Stewart, 2008b).

Family Support Services. The FMWR provides a wide range of facilities for promoting social and emotional well-being of military/civilian service personnel and their Families. The Fort Stewart ACS office within FMWR assists in maintaining the readiness of individuals, Families, and communities within the Army by developing, coordinating, and delivering services which promote self-reliance, resiliency, and stability during war and peace. Services are offered to Active, Retired, Army Reserve and National Guard Soldiers and their Families members, regardless of branch services, as well as, as DoD civilian employees and their Family members. Programs offered include the Army Family Action Plan, Family Advocacy Program, Survivor Outreach Service, and Warriors in Transition.

Public Recreation Services. Recreational resources on Fort Stewart are managed by the FMWR and include areas for swimming, boating, hiking, hunting, and fishing. Fort Stewart has allowed the public access to installation lands for hunting and fishing since 1959. In general, any hunting or fishing area not closed for military use is open to the public with appropriate permits and restrictions. Access is denied to specific areas when safety or security concerns exist, prescribed burning is under way, or natural resources do not support such usage. About 1,500 to 2,000 people have permits to hunt at Fort Stewart, and they make 40,000 to 50,000 hunting trips annually. About 3,000 to 4,000 people hold a fishing permit, and they make 60,000 to 80,000 fishing trips annually.

Environmental Justice. Environmental justice analysis is prescribed by E.O. 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," issued in 1994. This policy directive to federal agencies outlines appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the

health or environment of minority and low-income populations to the greatest extent possible. The existence of disproportionately high and adverse impacts depends on the nature and magnitude of the effects identified for each of the individual resources.

4.20.11.2 Environmental Consequences

No Action Alternative

There would be no change in impacts anticipated under the No Action Alternative. Fort Stewart's continuing operations would continue to represent a beneficial source of regional economic activity. No additional impacts to housing, public and social services, public schools, public safety, or recreational activities are anticipated. Fort Stewart is currently constructing one additional DoD elementary school, two child development centers, and one youth activity center. All high school-aged students currently attend schools off post and would continue to do so in the future.

The number of Soldiers who work and train on Fort Stewart lands has increased by more than 20 percent from 2003 to 2011. The majority of Soldiers and their Family members live in Hinesville, followed by Richmond Hill and the other off-post communities. Additional RCI housing for Soldiers and Families and single Soldiers was recently completed, which included the demolition of old, worn-down facilities and the construction of new, modernized houses and barracks. Other projects to enhance quality of life, such as shoppettes, gas stations, playgrounds, and similar sites have either been constructed or are pending construction. No adverse impacts to schools, public health and safety services, or environmental justice would be anticipated, and the installation would continue to contribute to the tax base of the local economy.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Economic Impacts. The implementation of Alternative 1 would result in the loss of up to 8,000 military employees (Soldier and Army civilians), each with an average annual income of $41,830. In addition, this alternative would affect an estimated 4,464 spouses and 7,680 dependent children, for a total estimated potential impact to 12,144 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 20,144.

Based on the EIFS analysis, there would be significant socioeconomic impacts for sales volume, income, employment, and population in the ROI for this alternative. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.20-6. Table 4.20-7 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.20-6. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	27.26	8.46	18.58	4.56
Economic Contraction Significance Value	- 12.15	- 6.26	- 7.34	- 2.63
Forecast Value	- 21.48	- 12.32	- 22.04	- 13.8

Table 4.20-7. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$297,822,900	$359,633,600	- 8,965 (Direct) - 791 (Indirect) - 9,756 (Total)	- 20,144
Percent	-21.48 (Annual Sales)	- 12.32	- 22.04	- 13.8

The total annual loss in volume of direct and indirect sales in the ROI represents an estimated -21.48 percent change from the current total sales volume of $1.38 billion within the ROI. State tax revenues would decrease by approximately $11.88 million as a result of the loss in revenue from sales reductions. Some counties within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be lost at the county and local level. Regional income would decrease by 12.32 percent. While 8,000 Soldier and Army government civilian positions would be lost within the ROI as a direct result of the implementation of Alternative 1, EIFS estimates another 965 military contract service jobs would be lost, and an additional 791 job losses would indirectly as a result of occur from a reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 9,756 jobs, or a -22.04 percent change in regional employment. The total number of employed positions (military and private employment) in the ROI is estimated to be 44,260. A significant population reduction of 13.8 percent within the ROI is anticipated as a result of this alternative. Of the approximately 146,000 people (including those residing on Fort Stewart) that live within the ROI, 20,144 military employees and their dependents would be projected to no longer reside in the area following the implementation of Alternative 1. This would lead to a decrease in demand for housing, and increased housing availability in the region. This could lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes Soldiers and civilian employees and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.20-8 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.20-8. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $274,958,832 (Local) - $612,911,252 (State)	- $370,596,376	- 8,605 (Direct) - 751 (Indirect) - 9,357 (Total)
Percent	- 19.92 (Total Regional)	- 12.70	- 21.14

The total annual loss in volume of direct and secondary sales in the region represents an estimated -19.92 percent change in regional sales volume according to the RECONS model, an impact that is 1.56 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume

numbers presented in the RECONS model, it is anticipated that state tax revenues would decrease by approximately $24.52 million as a result of the loss in revenue from sales reductions, which would be $12.64 million more in lost state sales tax revenue that projected by the EIFS model. Regional income is projected by RECONS to decrease by 12.70 percent, slightly more than the 12.32 percent reduction projected by EIFS. While 8,000 Army Soldier and government civilian positions would be lost within the ROI, RECONS estimates another 605 military contract and service jobs would be lost, and an additional 751 job losses would occur indirectly as a result of reduced demand for goods and services. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 9,357 jobs, or a -21.14 percent change in regional employment, which would be 0.90 percent less than projected by the EIFS model.

Schools. The loss of 8,000 Soldiers and their associated Family members would have moderate adverse impacts to schools both on and off post, as this would eliminate a major source of their functioning revenue. For off-post schools, this loss would be felt through the decrease in funding from the Federal School Impact Aid program, which provided more than $10 million to county schools in the ROI in 2010. Fort Stewart schools would not be as adversely affected, but would still see a corresponding loss in revenue. The installation has also constructed several child-based facilities in recent years, including Child Development Centers and Youth Activity Centers, buildings which would potentially no longer be needed under this alternative, as Soldiers and their Families are relocated to other areas. Other uses for these facilities would be required to ensure they are not underutilized. This impact would not be significant.

Public Health and Safety Services. Reduced population levels on Fort Stewart would potentially result in corresponding reduced demand for the services of military police, fire department, emergency service providers, and medical care providers both on and off post. Soldiers, retirees, and their dependents would continue to require these services, but at a reduced frequency. Family support services and/or providers on post may also be used less frequently, although off-post Family support services throughout the ROI would not likely experience a significant decrease in clients. This impact would not be significant.

Recreation Facilities. The reduction in force could decrease the frequency of use of recreation facilities on post to a moderate degree. Retirees already living in this area, as well as members of the public, would still utilize these resources. The reduction in use; however, could correspond to a loss in revenue for some of these facilities, such as campgrounds, which operate partially on a revenue-based system and not solely on funds input through the FMWR. Others not relying on this source of funding would be less impacted. This impact would not be significant.

Environmental Justice. Fort Stewart does not anticipate that a disproportionate adverse impact to minorities, economically disadvantaged populations, or children would occur in the ROI as a result of the reduction in force. This is because there are no disproportionately high low-income or minority populations within, adjacent to, or near the installation boundaries, nor within its overall ROI. Liberty County has a higher African-American population (and a slightly higher Hispanic population than Georgia as a whole. At the state-wide level, adverse impacts to Liberty County would disproportionately affect those groups.

When assessing the results together, both models seem to indicate that the economic impacts of the implementation of Alternative 1 would lead to a net reduction of economic activity within the ROI of roughly the same order of magnitude.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Economic Impacts. The implementation of Alternative 2 would result in the increase of up to 3,000 Soldiers, each with an average annual income of $41,830. In addition, this alternative would affect an estimated 1,674 spouses and 2,880 dependent children, for a total estimated potential impact to 4,554 dependents. The total population of Soldiers and their dependents directly affected by Alternative 2 would be projected to be 7,554.

Based on the EIFS analysis, there would be no significant impacts for sales volume, income, or employment. There would be significant impacts for increased population in the ROI. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.20-9. Table 4.20-10 presents the projected economic impacts to the region for Alternative 2 as assessed by the Army's EIFS model.

Table 4.20-9. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 2

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	27.26	8.46	18.58	4.56
Economic Contraction Significance Value	-12.15	-6.26	-7.34	-2.63
Forecast Value	8.06	4.62	8.27	5.17

Table 4.20-10. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$111,683,600	$134,862,600	3,362 (Direct) 297 (Indirect) 3,659 (Total)	7,554
Percent	8.06 (Annual Sales)	4.62	8.27	5.17

The total annual gain in direct and secondary sales represents an estimated 8.06 percent change in total sales volume from the current sales volume of $1.38 billion within the ROI. It is estimated that state tax revenues would increase by approximately $4.4 million as a result of the gain in revenue from sales increases. Some counties within the ROI supplement the state sales tax of 4 percent by varying percentages, and these additional local tax revenues would be gained at the county and local level. Regional income would increase by 4.62 percent. While 3,000 Soldiers would be gained within the ROI, EIFS estimates another 362 military contract service jobs would be gained, and an additional 297 jobs would be created indirectly as a result of increases in demand for goods and services in the ROI. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 3,659 jobs, or a 8.27 percent change in regional employment. The total number of employed positions (non-farm)) in the ROI is estimated to be approximately 44,260. A population increase of 5.17 percent within the ROI would be anticipated as a result of this alternative. Of the approximately 146,000 people (including those residing on Fort Stewart) that live within the ROI, 7,554 military employees and their dependents would be begin to reside in the area following the implementation of Alternative 2. This would lead to an increase in demand for housing, and decreased housing availability in the region. This would lead to a slight increase in median

home values. It should be noted that this estimate of population increase includes civilian and military employees and their dependents.

Table 4.20-11 shows the total projected economic impacts, based on the RECONS model, that would be projected to occur as a result of the implementation of Alternative 2.

Table 4.20-11. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment
Total	$103,109,562 (Local) $229,841,720 (State)	$138,973,641	3,227 (Direct) 282 (Indirect) 3,509 (Total)
Percent	7.46	4.76	7.93

The total annual gain in direct and secondary sales in the ROI would represent an estimated 7.46 percent change in total regional sales volume according to the RECONS model, an impact that is 0.60 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would increase by approximately $9.2 million as a result of the gain in revenue from sales reductions, which would be $4.8 million more in additional state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to increase by 4.76 percent, slightly more than the 4.62 percent increase projected by EIFS. While 3,000 Soldier positions would be gained within the ROI, RECONS estimates another 227 military contract and service jobs would be gained, and an additional 282 jobs would be created indirectly as a result of increases in demand for goods and services in the ROI. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 3,509 jobs, or a 7.93 percent change in regional non-farm employment, which would be 0.34 percentage points less than projected by the EIFS model.

Schools. Under this alternative, there would be a substantial increase in Soldiers and their Family members on post, as well as civilian employees and their Families. This would ensure the security of the revenue stream for the schools in the ROI, as well as a corresponding increase in funds as additional school-age children arrive with their Families. Existing facilities on post should be able to accommodate this amount of additional personnel; however, existing schools may feel a strain from the addition of the approximately 3,000 school-age children accompanying the incoming Soldiers and civilians. The construction of a new elementary school (replacing Diamond Elementary) is already in the planning stages, and the installation may require the construction of additional schools and youth-based facilities if these prove insufficient to accommodate the need. This impact would not be significant.

Public Health and Safety Services. Increased population levels on Fort Stewart would increase the demand for services from military police, fire department, emergency service providers, and medical care providers both on and off post. Additional medical clinics may be required, as the capacity of existing clinics and the hospitals becomes strained. Family support services and/or providers on post may experience a frequency in use, as more residents move into the ROI with the growth in force. This impact would not be significant.

Recreation Facilities. The demand for and frequency of use of recreation facilities on post would most likely increase as a result of this alternative. Impacts would be minor when considering the large number of existing recreational resources on post available for use by the incoming personnel. The FMWR may require additional servicing of their facilities, facility

upgrades, and/or personnel to accompany the corresponding minor increase in demand for these resources. This impact would not be significant.

Environmental Justice. Fort Stewart does not anticipate a disproportionate adverse impact to minorities, economically disadvantaged populations, or children would occur in the ROI as a result of an increase of this size. This is because there are no disproportionately high low-income or minority populations within, adjacent to, or near the installation boundaries, nor within its overall ROI. Liberty County has a higher African-American population (and a slightly higher Hispanic population than Georgia as a whole. At the state-wide level, adverse impacts to Liberty County would disproportionately affect those groups.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 2 would lead to a net beneficial impacts and growth of economic activity within the ROI of roughly the same order of magnitude.

4.20.12 Energy Demand and Generation

4.20.12.1 Affected Environment

Fort Stewart's energy consumption draws from six different sources of energy: electric power and natural gas, both delivered by commercial utilities, as well as No. 2 fuel oil, propane, waste wood, and waste oil. The abundance of energy sources, and adequate supplies from each source, provide Fort Stewart with ample excess energy capacity.

4.20.12.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in negligible energy demand and generation impacts. Fort Stewart's ranges and garrison area would continue to use and generate the same types and amounts of utility consumption for which the installation is already managing. Maintenance of existing utility systems would continue.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to energy demand due to the reduction in the on-post usage and decrease in the requirement for energy associated with the reduction in Soldiers. Fort Stewart would continue to search for innovative ways to conserve energy as a result of this alternative, as mandated by law and ARs for energy conservation.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor adverse impact to energy demand due to the addition of up to 3,000 Soldiers and their Family members on post and their associated energy usage and requirements. Fort Stewart's existing energy infrastructure has sufficient excess capacity, diversity, and scalability to readily accommodate this growth if existing facilities would be utilized. If new facilities are needed, then the existing infrastructure may need to be improved. Fort Stewart would continue to implement energy conservation measures to improve the installation's energy efficiency.

4.20.13 Land Use Conflicts and Compatibility

4.20.13.1 Affected Environment

Land use at Fort Stewart is divided into the following categories: garrison, training lands, recreation, aesthetics and visual resources, and buffer and joint use areas (Fort Stewart, 2005). The garrison area is in the south-central portion of Fort Stewart next to the City of Hinesville and

consists of the administrative, operational, and residential portions of the installation. Fort Stewart's range and training land infrastructure support Abrams Tank, Bradley Fighting vehicle, Aerial Gunnery, Artillery, and other live-fire training, maneuver training, and individual team and collective tasks. Range Support Operations estimates about 200,000 Soldiers annually use the range facilities at Fort Stewart for mounted and dismounted individual weapons and crew qualifications. This number includes company/team through BCT maneuver exercises.

Fort Stewart maintains active ACUB and JLUS programs, working with local community partners to protect natural resources and sustain military operations. Common goals are to minimize rural land conversion to dense residential development around the installation, utilizing a variety of methods (depending on property owners' objectives), and to encourage compatible development.

4.20.13.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, no changes to land use conditions would occur and, therefore, no impacts would be anticipated. Training activities would continue on Fort Stewart at their current frequency.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have minor beneficial impacts to land use. A reduction in training land use would be anticipated that roughly correlates with the number of Soldiers inactivated or realigned as a result of this alternative. A reduction in training activities would allow more opportunities for other land uses such as ecosystem management or recreational activities.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated minor impact to land use. The addition of up to 3,000 additional Soldiers would require the additional use of training areas and qualification ranges. These uses may require an increased need for management and balancing of training priorities such as unit live-fire and maneuver training activities.

4.20.14 Hazardous Materials and Hazardous Waste

4.20.14.1 Affected Environment

The affected environment includes the use, storage, transport, and disposal of hazardous materials and waste at Fort Stewart. This includes hazardous materials and waste from USTs and ASTs, pesticides, LBP, asbestos, PCBs, radon, and UXO. Each installation operates under a HWMP that manages hazardous waste to promote the protection of public health and the environment. Army policy is to substitute toxic and hazardous materials for nontoxic and nonhazardous ones; ensure compliance with local, state, and federal hazardous waste requirements; and ensure the use of waste management practices that comply with all applicable requirements pertaining to generation, treatment, storage, disposal, and transportation of hazardous wastes. The program reduces the need for corrective action through controlled management of solid and hazardous waste.

4.20.14.2 Environmental Consequences

No Action Alternative

Overall, negligible impacts are anticipated under the No Action Alternative. There would be no change in Fort Stewart's management of hazardous materials, toxic substances, hazardous

waste, or contaminated sites. Fort Stewart would continue to manage existing sources of hazardous waste in accordance with the HWMP.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

The implementation of Alternative 1 would have an anticipated minor impact to hazardous materials and waste. In the short term, there would be an increase in the demolition of outdated and no longer needed facilities, which would increase the volume of solid waste generated. In addition, an increase in asbestos containing materials and LBP disposal is anticipated until facility reduction is completed. Construction workers and Army personnel would take measures to dispose of materials in accordance with regulatory requirements and installation management plans. There would be limited increase in human health risk, or risk of environmental contamination as materials and wastes would be handled in accordance with the HWMP.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

The implementation of Alternative 2 would have an anticipated minor impact to hazardous materials and waste. There would be an increased amount of storage, use, handling, and disposal of hazardous materials, toxic substances, and hazardous wastes, due to the increase in Soldier strength; however, this would not increase the risk to human health due to direct exposure, would not increase the risk of environmental contamination, and would not violate applicable federal, state, local, or DoD regulations. Hazardous materials and wastes would be handled in accordance with the HWMP. Soldiers would be educated on existing management procedures, regulations, plans, and permits, per standard Army protocols, which would minimize risks.

4.20.15 Traffic and Transportation

4.20.15.1 Affected Environment

Regional access to Fort Stewart and Hinesville is from I-95 and I-16, U.S. Highway 84, and Georgia highways 119 and 144. Georgia Highway 119, a north-south highway, bisects Fort Stewart and separates the primary heavy maneuver training areas from the collective firing ranges. Georgia Highway 144, an east-west highway, separates Training Areas A and D from Training Areas B, C, E, and F in the northern portion of Fort Stewart and is the primary ground route to Hunter Army Airfield, Savannah, and I-95. A network of improved roads serves the main garrison area. About 400 miles of tank trails and unpaved roadways are outside the cantonment area.

4.20.15.2 Environmental Consequences

No Action Alternative

Surveys and studies conducted on the existing Fort Stewart transportation system determined that, although basically adequate to meet current needs, it is congested. Minor impacts to transportation would occur under the No Action Alternative. Minor delays at main ACPs during peak traffic hours would continue to occur. The traffic study determined that traffic intersection improvements are needed, and the roads themselves are beginning to physically degrade and require resurfacing. Recommendations to improve the system were provided and the installation has already completed both the NEPA review and/or construction for many of these projects. Recommended measures for correcting deficiencies would continue to be addressed.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Alternative 1 would have an anticipated beneficial impact to traffic and transportation systems. As fewer Soldiers and their Family members are left on post, traffic congestion would diminish

and travel delays would decrease. The roads would continue to be maintained and LOS for on- and off-post commuters would improve as traffic volume decreased. Delays at ACPs during peak traffic hours would also decrease. Transportation improvement projects planned to note existing deficiencies would still be implemented, improving the traffic and transportation environment even further.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Alternative 2 would have an anticipated moderate, less than significant, short and long-term impacts on traffic and transportation systems. The increase in off-post traffic would have a minimal impact on traffic in the community overall and could contribute to a decrease in the LOS of the road network leading to the installation from off post, particularly during peak morning and afternoon travel periods. This increase in population would also have a moderate impact on the traffic volume on the installation, and could cause a minor decrease in LOS on some of the installation's interior routes. The increased traffic volume in both the neighboring community and on the installation could pose an increased level of risk to the safety of pedestrians and bicyclists. Planned transportation improvement projects would still be implemented, improving the traffic and transportation environment.

4.20.16 Cumulative Impacts

Region of Influence

The ROI for the cumulative impacts analysis of the Army 2020 realignment at Fort Stewart encompasses five counties in the state of Georgia. The City of Hinesville, the city most immediately adjacent to the Fort Stewart cantonment area, is the largest city in Liberty County and has grown to be a progressive and pro-business community. Impacts may be felt to a lesser extent in Tattnall, Long, Evans, and Bryan counties. Fort Stewart has long been a key component of the economy of these counties since its development in the 1940s, employing several thousand Soldiers and civilian employees within the ROI and actively supporting the Army's Mission.

There are several planned actions within the ROI that have the potential to cumulatively add impacts to Army Force 2020 alternatives. These actions are either in progress or reasonably could be initiated within the next 5 years, as indicated in the installation's Real Property Master Planning processes. A list of projects below presents some of the projects which may add to the cumulative impacts of the implementation of Army 2020 realignment alternatives.

Fort Stewart Projects (Past, Present, and Reasonably Foreseeable)

- Construction of a Modified Record Fire Range, Infantry Platoon Battle Course, and Multi-Purpose Machine Gun Range;
- Improvements to the Convoy Live-Fire Training Area;
- Construction of a Digital MPTR, a Automated Combat Pistol Qualification Course, a Qualification Training Range, Military Working Dog Complex, and new facilities within the Georgia Army National Guard Complex (to include demolition of two existing facilities);
- Upgrades to Wright Army Airfield to include an UAS hangar, company operations facility, and a tactical equipment maintenance facility; and
- The construction of a Tactical Unmanned Aerial Vehicle Hangar Complex and five temporary Tactical Unmanned Aerial Vehicle storage hangars at Evans Army Airfield for the 3rd Infantry Division, as well as the construction of a Tactical Unmanned Aerial Vehicle Hangar Complex for the Georgia Army National Guard.

Other Agency (DoD and non-DoD) Actions (Past Present and Reasonably Foreseeable)

A runway extension is proposed at the joint use Midcoast Regional Airport at Wright Army Airfield.

Fort Stewart anticipates a range of cumulative impacts resulting from the implementation of the Proposed Action and its alternatives. Cumulative impacts for each alternative are as follows:

No Action Alternative

No adverse cumulative impacts would be anticipated from implementing the No Action Alternative. No changes in military authorizations or local environmental conditions would be anticipated, and installation facility shortages and excesses would remain at their currently planned levels without additional stationing or force reductions. The Army would continue to implement some facilities reductions of outdated/unused facilities as part of the FRP as well as some improvements. Under the No Action Alternative, cumulative impacts would not be more than minor impacts within the ROI.

Alternative 1: Force Reduction (up to 8,000 Soldiers and Army Civilians)

Cumulative impacts as a result of the implementation of Alternative 1 range from beneficial to significant. Negligible or minor cumulative impacts are anticipated for the following VECs: air quality, airspace, noise, soil erosion, biological resources, wetlands, surface water, hazardous materials and hazardous wastes, and traffic and transportation. The reduction of Soldiers on Fort Stewart would produce fewer training events, resulting in fewer air emissions (to include dust and particulates) and generation/use of hazardous materials and wastes, less soil erosion on existing roads and tank trails (improved and unimproved) from mechanized and/or wheeled vehicular traffic, and fewer impacts from travel on and off road to streams and connected wetlands and surface waters. Impacts to biological resources, such as protected species, would also be beneficial.

Fewer Soldiers residing on the installation would result in beneficial cumulative impacts to water supply and wastewater treatment, facilities, energy demand and generation, and traffic and transportation resources on post, as the demand for these resources would decrease.

Minor cumulative impacts are anticipated for cultural resources, but significant adverse cumulative impacts are anticipated for socioeconomics, both are discussed in more detail in the paragraphs that follow.

Cultural Resources. As a result of Alternative 1, minor cumulative impacts to cultural resources are anticipated. It is likely that the implementation of Alternative 1 would involve reducing the number of facilities on post, which may require consultation with the SHPO. Reasonably foreseeable future projects occurring on Fort Stewart in conjunction with Army 2020 force reduction would continue to undergo surveys and cultural resources would be avoided and/or mitigated for, including (when applicable) consultation with the SHPO. This includes both archaeological resources and historic structures, minimizing the potential for adverse effect to this resource. When considered cumulatively with Alternative 1, impacts would be minor.

Socioeconomics. As a result of Alternative 1, the Army anticipates significant adverse cumulative socioeconomic impact. Fort Stewart already accommodates a considerable amount of training (Infantry and Heavy Brigade). Any impacts from a loss of up to 8,000 Soldiers alone are not anticipated to change the installation's mission. However, nearby communities, such as Hinesville, would have to make considerable changes to their revenue stream in order to generate and/or make up for the tax, property, and school revenues it will lose once these Soldiers and their Families no longer reside, work, and/or live in the ROI. Regional

unemployment increased from 2006 through 2012, and the implementation of Alternative 1 would result in significant adverse cumulative economic impacts within the ROI.

Alternative 2: Installation gain of up to 3,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Cumulative impacts are projected to range from beneficial socioeconomic impacts to less than significant impacts to other VECs. The following VEC areas are anticipated to experience minor cumulative impact as a result of the implementation of Alternative 2: airspace, noise, soil erosion, biological resources, wetlands, water resources, energy demand and generation, hazardous materials and hazardous waste, and traffic and transportation.

Airspace. The increased operations as a result of the implementation of Alternative 2 could cause some minor impacts on air traffic flow within the NAS around Fort Stewart. This could result in limited time available for commercial and civilian use of Wright Army Airfield, a joint-use airfield with the City of Hinesville.

Noise. Noise levels may be elevated to NZ II during days of heavier training and military and/or civilian traffic. Construction may also contribute to noise levels, especially if it occurs adjacent to the installation boundary and near adjacent residential communities. Disturbance to wildlife receptors on or off post and to residential receptors is anticipated to be short term and not permanent. Though during these times of increased noise intensity, peak noise would not remain elevated, nor would this increase require a modification to the installation's noise management plan.

Soil Erosion. Soil erosion impacts to stormwater conveyance systems and other water bodies would result from the combination of construction projects on and off post and additional maneuver traffic. The installation anticipates the potential for increased siltation and sedimentation which could have water quality impacts, as well as impacts on the installation's federal- and state-listed species, which rely on those water sources for foraging and survival.

Biological Resources. There would be no minor cumulative impacts to biological resources. Installation range construction would result in minor cumulative impacts that would occur as ranges become operational and additional ranges are constructed at Fort Stewart. Cumulative projects considered within the ROI could amplify scheduling difficulties in accessing training areas for wildlife management. It is anticipated that continuing communication with Range Control can help minimize adverse wildlife management impacts.

Wetlands. The projects ongoing and reasonably foreseeable have been assessed for wetland impacts. The loss or degradation of wetland systems associated with these projects have either been avoided or minimized to the greatest extent practicable. That, coupled with Fort Stewart's planning practices for training events, would prevent more than minor cumulative impacts to wetland areas.

Water Supply and Wastewater Treatment. With the addition of the facilities listed above and a Soldier growth of up to 3,000, greater utility usage and demand is anticipated; however, each system has the capacity to meet these increased demands. This remains true even with the large projected growth and rapid increase regionally of the ROI population.

Surface Water. Ongoing and reasonably foreseeable future construction actions have the potential to impact impaired water bodies and/or stream buffers; however, designs of installation construction projects are thoroughly reviewed during construction planning to minimize any potential impacts to surface water. Effective implementation of the NPDES permit requirements, and the erosion and sedimentation pollution control plans during construction, and post construction BMPs would also reduce the potential adverse impacts to surface water.

Energy Demand and Generation. Although energy conservation is a vital and critical issue, the energy resource commitment as a result of the implementation of Alternative 2, along with ongoing and future construction, is not anticipated to be excessive in terms of region-wide usage. Materials and energy are not in short supply and their use would not have an adverse impact upon continued availability of these resources.

Hazardous Materials and Hazardous Waste. Hazardous materials and waste would increase with the addition of up to 3,000 Soldiers, as well as from ongoing and future construction and operation of the facilities listed above. Hazardous materials and waste management protocols would not change at Fort Stewart as a result of these actions, because units would continue to adhere to installation, state, and federal guidelines for hazardous materials and waste.

Traffic and Transportation. With the increase in military personnel, there would be an associated increase of traffic on post, with minor impacts. When considered cumulatively with Alternative 2, it is not anticipated that substantial changes to the road and tank trail rehabilitation projects currently planned or completed would be needed. Existing roads and tank trails are expected to accommodate the increased throughput. The number of vehicles entering and exiting the installation would not grow to a point that levels of service would be adversely impacted nor would access be significantly affected.

Impacts to the following VEC areas are anticipated to be more than minor in nature. These VECs are presented in additional detail below and include: cultural resources and facilities.

Cultural Resources. The increase in vehicle traffic and construction may directly damage unknown, undocumented artifacts. Adverse impacts to cultural resources or historic properties would require additional consultation with the SHPO, per 36 CFR 800. Indirect impacts to cultural or historic resources may come from the percussion or vibration of additional traffic from heavy tactical and non-tactical vehicles. Cumulatively, the installation CRM consults on all installation projects and implementation of the CRMP would be expected to result in less than significant cumulative impacts.

Facilities. Three ranges, in addition to ongoing construction, are expected to be constructed in the future; however, a range facility shortfall would still exist as result of the implementation of Alternative 2. This shortfall would be cumulatively less than significant and would be managed through scheduling of range facilities.

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4.21 FORT WAINWRIGHT, ALASKA

4.21.1 Introduction

U.S. Army Garrison Fort Wainwright (USAG FWA) is an Army garrison located in the Tanana River Valley of central Alaska, north of the Alaska Range, approximately 120 miles south of the Arctic Circle and adjacent to the City of Fairbanks. Environmental management of the approximately 1.6 million acres of Army range and training lands in Interior Alaska is currently the responsibility of USAG FWA. USAG FWA exercises authority over all of the range and training lands north of the Alaska Range, inclusive of the USAG FWA cantonment, Tanana Flats Training Area (TFTA) to the south, Yukon Training Area (YTA) to the east, and Donnelly Training Area (DTA), located approximately 100 miles to the southeast and near the City of Delta Junction. Also associated with USAG FWA are the Black Rapids Training Area, located to the south of DTA, and the Gerstle River Training Area (GRTA), located to the east of DTA. Figure 4.21-1 shows the Interior Alaska training areas.

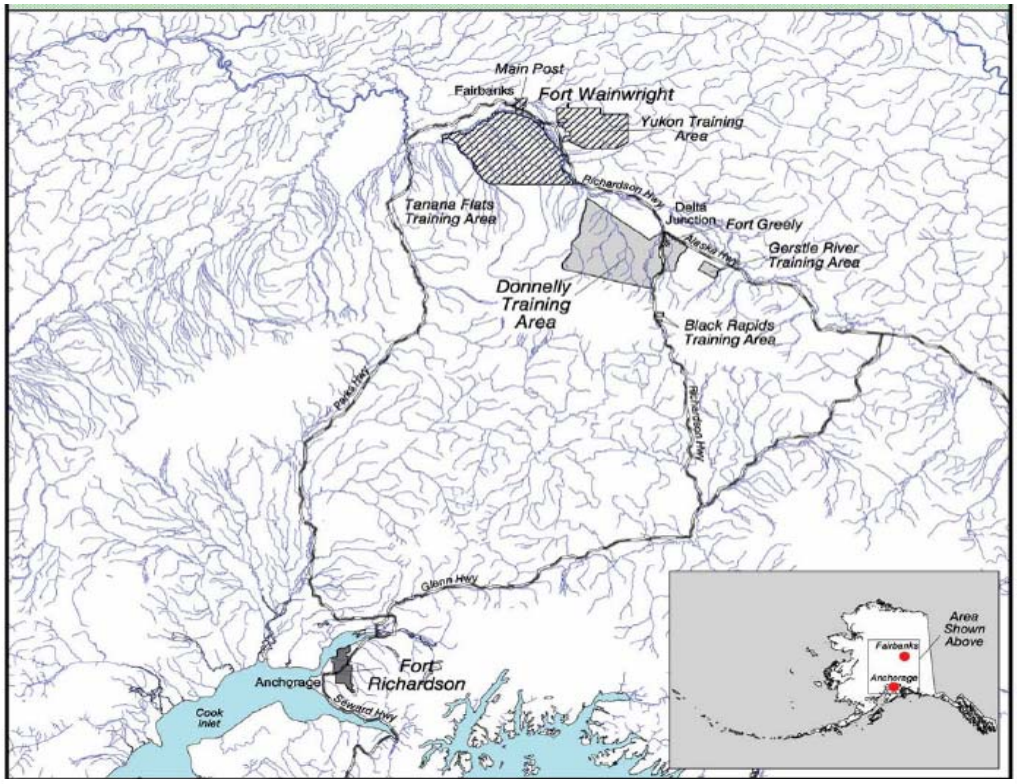

Figure 4.21-1. Fort Wainwright Main Post, Tanana Flats Training Area, Yukon Training Area, and Donnelly Training Area East

USAG FWA supports the stationing of several USARAK units, including the 1/25th SBCT, 16th CAB Aviation Mission Command Element (Alaska), 6-17th Cavalry, Detachment for B/209th Aviation Support Battalion, 1-52nd General Support Aviation Battalion, 472nd Military Police Company, Detachment from the 28th Military Police, 539th Transportation Company, 65th Ordnance Company, 9th Army Band, Detachment C from the 125th Finance Management Company, 507th Signal Company, and Northern Warfare Training Center. USAG FWA also supports several tenants including Cold Regions Test Center, the Cold Regions Research and Engineering Laboratory, Medical Department Activity, and the BLM Alaska Fire Service. USAG FWA is responsible for ownership and stewardship of withdrawn training lands for Army use.

USARAK is responsible for mission requirements which drive range usage and management. All Active Duty units are assigned to USARAK and utilize USAG FWA lands and facilities.

The USAG FWA borders the east and southeast sides of Fairbanks in the Chena River watershed. USAG FWA is home to the modularized 1/25th SBCT and 16th CAB. Approximately 6,600 USARAK Soldiers are stationed at USAG FWA. The approximate 645,000-acre DTA is south of Delta Junction in the Tanana Basin watershed, which is an Interior Alaska glacial waterway. DTA is a training facility that supports Army training, as well as joint and international training events. No Soldiers are permanently stationed at DTA.

USAG FWA has in recent years produced a variety of NEPA analyses evaluating several actions including Army force transformation efforts, the addition of Soldiers and new equipment, a general increased use of training lands, and numerous range development projects. The following documents (incorporated by reference) provide a synopsis of previous environmental analysis of USARAK Transformation, stationing actions, and evolution of day-to-day operations.

- *Transformation of U.S. Army Alaska Final EIS, May 2004*. This document analyzes the impacts to USARAK lands and surrounding communities and land users associated with the transformation of the 172nd Infantry Brigade (Separate) at USAG FWA and FRA into the 1-25th SBCT. This EIS serves as a foundational reference source for this PEA, particularly in regards to USAG FWA.
- *Battle Area Complex/Combined Arms Collective Training Facility EIS (BAX/CACTF) Final EIS, June 2006.* This document provides an environmental analysis of construction and operation of a combat training facility at DTA East. This EIS focuses on the existing environment at DTA East and provides a comprehensive description of existing resources. The *BAX/CACTF EIS* (2006) will serve as a foundational reference source for this PEA, particularly in regards to DTA.
- *Conversion of the Airborne Task Force to an Airborne Brigade Combat Team EA, 2006*. This document analyzes the impacts associated with conversion of the existing airborne task force into the 4-25 Airborne BCT at FRA.
- *Environmental Assessment for Donnelly Training Area East Mobility and Maneuver Enhancements, Fort Wainwright, Alaska, 2008*. This document analyzes the impacts associated with the expansion of the Donnelly Drop Zone, trail improvements, and creation of a hardened bivouac to accommodate changing mission requirements at DTA.
- *Alaska Army Lands Withdrawal Renewal Final Legislative EIS, 1999*. This document demonstrates the need for and examines the renewal of the existing military withdrawals of USAG FWA YTA and Fort Greely West Training Area and Fort Greely East Training Area from public use for military purposes until November 6, 2051. Fort Greely West and East Training Areas have subsequently been renamed DTA West and East training areas.
- *U.S. Army Pacific Supplemental Programmatic EIS for Army Growth and Force Structure Realignment, 2008*. This document evaluates the effects associated with growing and realigning the Army's force structure to support military operations in the Pacific Theater, including the addition of approximately 2,200 new Soldiers in Alaska.
- *USAG Alaska Grow the Army Force Structure Realignment EA, 2008.* Tiering off the above EIS, this document evaluates the effects associated with facility construction and training actions to accommodate new military units to be stationed in Alaska. The EA analyzes site-specific facility and range construction as well as increased training that will be necessary to support incoming Soldiers and their Families.

- *U.S. Army Garrison Alaska's Range Complex and Training Land Upgrades Programmatic EA, March 2010*. This document analyzes the implementation of various management actions to maximize the efficiency and effectiveness of environmental review of range and training land projects at USAG FWA.
- *INRMP 2007-2011 and 2007 INRMP EA, January 2007*. These documents describe standard policies and procedures for managing natural resources to ensure sustainability of USAG FWA lands.
- *ICRMP, 2001.* This document outlines treatment for and management of USAG FWA cultural resources.
- *ITAM Plan and ITAM EA, October 2005 and June 2005, respectively.* These documents focus on managing sustainable use of training areas and provide recommended measures to achieve sustainability and rehabilitation of lands impacted by training.
- *Army Small Arms Training Range Environmental BMPs, 2005*. This document provides a manual of BMPs used on Small Arms Training Ranges.

4.21.1.1 Valued Environmental Components

For alternatives the Army is considering as part of Army 2020 force structure realignments, USAG FWA does not anticipate any significant adverse environmental impacts as a result of the implementation of Alternative 1 (Force reduction of up to 4,900 Soldiers and Army Civilians) or Alternative 2 (Installation gain of up to 1,000 Soldiers). However, USAG FWA does anticipate significant socioeconomic impacts to economic activity (employment and population) resulting from the implementation of Alternative 1. Table 4.21-1 summarizes the anticipated impacts to VECs from each alternative.

Table 4.21-1. Fort Wainwright Valued Environmental Component Impact Ratings

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 4,900	Alternative 2: Growth of up to 1,000
Air Quality	Minor	Beneficial	Minor
Airspace	Minor	Beneficial	Minor
Cultural Resources	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Noise	Minor	Beneficial	Minor
Soil Erosion	Minor	Minor	Minor
Biological Resources	Minor	Minor	Minor
Wetlands	Minor	Minor	Minor
Water Resources	Minor	Minor	Minor
Facilities	Negligible	Minor	Minor
Socioeconomics	Minor	Significant	Beneficial
Energy Demand and Generation	Negligible	Beneficial	Minor
Land Use Conflict and Compatibility	Minor	Minor	Minor

Valued Environmental Component	No Action Alternative	Alternative 1: Force Reduction of up to 4,900	Alternative 2: Growth of up to 1,000
Hazardous Materials and Hazardous Waste	Negligible	Negligible	Negligible
Traffic and Transportation	Minor	Beneficial	Minor

4.21.2 Air Quality

4.21.2.1 Affected Environment

USAG FWA is located within the Northern Alaska Intrastate AQCR. The main emission source at USAG FWA is the Central Heating and Power Plant, which consists of six, 230 x 10^6 British thermal unit per hour coal-fired boilers. In addition, several insignificant emissions units, including small backup generators, small boilers for building heating, and USTs, are located within the boundary limits of the cantonment area. Emissions of three of the six criteria pollutants (CO, NO_x, and SO_2) and HAPs from emission units located at USAG FWA exceed the Title V Operating Permit Program (Title V) major source thresholds (100 tpy for each criteria pollutant, 10 tpy for any one HAP, and 25 tpy for total HAP). Emissions of the other three criteria pollutants (PM, VOCs, and lead) are less than the Title V major source thresholds. Because emissions exceed the Title V major source threshold when USAG FWA is considered a single stationary source, it is subject to the requirements of Title V.

On August 15, 2008, the utility systems at Fort Wainwright, including the electric and heat distribution, power generation, water distribution, and wastewater collection utility system, were privatized to a private utilities contractor. Through privatization, ownership of all affected systems and associated environmental permits were transferred to the private utilities contractor. In anticipation of the ownership transfer and associated environmental permits, USAG FWA submitted two separate Title V permit renewal applications on November 7, 2007 - one for the emission units that were anticipated to remain under the control of USAG FWA and one for the emission units that would be owned by the private utilities contractor. USAG FWA was operating under Alaska Title V Permit No. AQ0236TVP01, which expired on May 13, 2008. USAG FWA was required to submit a renewal application no later than 180 days prior to the expiration date of the permit (i.e., November 13, 2007). On December 5, 2008, Title V permits were issued to USAG FWA (Permit No. AQ0236TVP02) for the units under ownership of the USAG FWA and to the private utilities contractor (Permit No AQ1121TVP01) for the utility units purchased through the privatization contract.

On July 18, 1997, EPA promulgated the primary $PM_{2.5}$ NAAQS at 15 µg/m^3 for the annual standard and at 65 µg/m^3 for the daily standard. In 2004, Alaska recommended that the EPA designate all areas of the state in attainment for the annual and 24-hour standards; however, on October 17, 2006, the EPA revised the primary and secondary 24-hour NAAQS for $PM_{2.5}$ to 35 µg/m^3 and retained the existing annual standard. Ambient air monitoring conducted in downtown Fairbanks from 2004 through 2006 revealed $PM_{2.5}$ ambient concentrations exceeded the revised NAAQS. As such, on December 22, 2008, the EPA classified portions of the Fairbanks North Star Borough (FNSB) as a nonattainment area for $PM_{2.5}$. The nonattainment boundary consists of a portion of the Fairbanks North Star Borough, urban Fairbanks, and USAG FWA, and excludes Eielson Air Force Base, TFTA, and YTA.

The nonattainment designation for the FNSB begins the process whereby Alaska must develop an implementation plan (i.e., SIP) that includes, among other things, a demonstration showing

how it would attain the ambient standards by the attainment dates required in the CAA. Under Section 172(b) of the CAA, states have up to 3 years after EPA's final designations to submit their SIPs to EPA; therefore, Alaska's $PM_{2.5}$ SIPs would have to be submitted no later than approximately April 2012. The end result is an attainment plan that serves as the basis for deriving local requirements and regulations that could impose additional standards and conditions on sources of emissions within the nonattainment area. The attainment plan, which is incorporated into the SIP, considers an emission budget, community growth (population and economic), and any federal projects that may offset emissions.

If a federal action at Fort Wainwright results in direct emissions of $PM_{2.5}$ or a precursor (SO_2 and NO_x) of less than 100 tpy, the action is considered to be insignificant with respect to interfering with the attainment or maintenance of the $PM_{2.5}$ NAAQS; and thereby, conforming to the SIP. When the applicability analysis shows that a Proposed Action must undergo a conformity determination, the Army must first show that the action would meet all SIP control requirements, and the emissions from the action would not interfere with the timely attainment of the standard, the maintenance of the standard, or the area's ability to achieve an interim emission reduction milestone.

DTA is not considered a major source facility. Emission sources associated with 7,000 acres, now known as Fort Greely, were transferred to the Space Missile Defense Command on 01 October 2002. The Title V Permit Application originally submitted by USAG Alaska in December 1997, was transferred from USAG Alaska to the Space Missile Defense Command.

4.21.2.2 Environmental Consequences

No Action Alternative

There would continue to be minor short- and long-term air emissions impacts from training and installation operations under the No Action Alternative. These impacts would continue at current levels under the installation's Title V permit. Permit conditions would continue to be monitored and met, but no changes to emission sources are anticipated, other than those mandated by maintenance, replacement, or elimination of sources as they age or are removed from service.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

There would be an anticipated beneficial impact to regional air quality from reduced stationary and mobile emission sources. There would be less combustion and generation of NAAQS pollutants and HAPs associated with military training.

Construction related impacts and impacts of facilities demolition would be temporary and would include an increase in dust mobile source emissions from construction vehicles and limited demolition activity. Long-term effects from reduction of these units at USAG FWA would include a decrease in stationary source emissions such as from boiler units and generators used in new facilities and by units using transportable generators during training operations. Fewer vehicles would contribute to air pollutants (for example CO and O_3) in the vicinity of USAG FWA's cantonment area. Since no training infrastructure construction would occur, no soil disturbance generating fugitive dust would occur. Additionally, fewer generators would be used to support operations. The risk of wildfires would also decrease, eliminating the possibility of military-caused short-term adverse impacts to air quality.

A decrease in maneuver activities would occur resulting in a decrease of opacity or fugitive dust emissions, and vehicle emissions, including PM, CO, and O_3.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be an anticipated minor impact on air quality in the airsheds surrounding USAG FWA as a result of implementing Alternative 2. There would be an anticipated minor increase in air emissions from both mobile and stationary sources that would be generated to support additional Soldiers and their Families. Though USAG FWA can anticipate increased emissions from military vehicles and generators used to support training events as well as increases in fugitive dust, the increase of 1,000 Soldiers would have minor impacts to regional air quality. USAG FWA would not be anticipated to exceed the emissions limits of its Title V permit or to engage in activities causing any change in attainment status or exceedance of NAAQS. Construction related impacts would be temporary and would include an increase in dust mobile source emissions from construction vehicles and limited demolition activity. Long-term effects from stationing these units at USAG FWA could include an increase in stationary source emissions such as from boiler units and generators used in new facilities. The use of this equipment may require USAG FWA to apply for a major or minor air quality permit through the Alaska Department of Environmental Conservation. Alternative 2 would add POVs and 200-300 additional fleet vehicles (tactical and non-tactical vehicles that may require an additional maintenance facility). Additional vehicles would contribute to air pollutants (for example CO and O_3) in the vicinity of USAG FWA's cantonment area.

If Alternative 2 is implemented, the need for conformity review would be determined when exact unit equipment and facilities requirements are known and can be more fully assessed at the installation. An air conformity determination may be required to support new unit stationing.

Short-term effects from construction of additional facilities would occur. Construction vehicles involved with some range expansion would cause soil disturbance that may generate fugitive dust leading to additional air quality impacts. Additionally, fugitive emissions and dust generated from construction of ranges would affect the areas adjacent to ranges, but are likely to be contained within the range area. BMPs would be used to mitigate fugitive dust emissions during construction. Live-fire activities may also increase the risk of wildfires, which may create short-term adverse impacts to air quality. Fires can add CO, $PM_{2.5}$, and polycyclic aromatic hydrocarbons, among other combustion byproducts. In addition, the smoke created from fires can travel great distances and potentially impact on-post housing and off-post communities. Maneuver activities may increase by about 10 to 20 percent. Smaller unit maneuvers would continue to be supported at USAG FWA, while company-level and above would be supported at DTA, TFTA, and YTA. Vehicles associated with Combat Support or Combat Service Support training occurring on roads, trails, or hardened surfaces would increase the occurrence of opacity or fugitive dust emissions; however, these effects are anticipated to be localized to the range area. Vehicle emissions would also add to the pollutants currently being released in maneuver areas including PM, CO, and O_3. In addition, Combat Support units would have an increased (localized) effect to air quality from off-road maneuvering. The increase in off-road maneuvers would denude soils of vegetation and could lead to increased opacity and fugitive dust within the range area. The USARAK ITAM program is an existing Army program that would continue to monitor vegetation loss and soil erosion, and conduct maneuver damage repair and revegetation, as needed.

4.21.3 Airspace

4.21.3.1 Affected Environment

Aviation is an essential component of transportation in the USAG FWA region and across the State of Alaska. The civilian aviation community utilizes Fairbanks International Airport as well as numerous smaller airfields within the region. The military, in cooperation with the State of

Alaska and the FAA has established no-fly areas and altitude restrictions to minimize the impact on communities and environment as well as commercial and general aviation. The Fairbanks North Star Borough has established policies of planning and zoning to control or prohibit residential or commercial activities that may conflict with military activities. In addition, a 2006 JLUS (FNSB, 2006) established compatible use zones and air safety zones around both USAG FWA and Eielson Air Force Base.

USAG FWA has its own airfield, Ladd Army Airfield, and also uses nearby Eielson Air Force Base for large-scale deployments. Both the airfield and the Air Force Base can support the aerial operations of all military aircraft to include C-17 transport aircraft. Ladd Army Airfield has one active runway; several ancillary taxiways, and hangars. The airspace surrounding Ladd Army Airfield is classified as Class D. USAG FWA operates its Small Arms Ranges in SUA called Controlled Fire Areas that are considered "Non-Rulemaking," which is non-regulatory in nature and there for transparent to any transitioning aircraft. There are currently five MOAs that extend varying from 100 AGL, 300 AGL and 500 AGL to 17,999 feet MSL. The MOAs span from south of Delta Junction to north of Fairbanks. The YTA contains Restricted Airspace R-2205 that covers the eastern portion of the training area and the Stuart Creek Impact Area that extends from the surface to 20,000 MSL. Restricted airspace overlays the southern portion of the TFTA in R-2211 that is operational from the surface to FL310. Controlled Fire Areas are also located at the DTA Small Arms Ranges. Most of DTA West is within the Restricted Area R-2202A, B and C with an altitude from the surface to FL310. The Restricted Areas are closed to all non-participating aircraft during periods of scheduled activity. Nearby Allen Army Airfield is capable of supporting C5/C17 aircraft and is also defined as Class D airspace. There is also a small unpaved light aircraft landing strip north at Delta Junction.

4.21.3.2 Environmental Consequences

No Action Alternative

The No Action Alternative would not produce any new conflicts with overlying restricted airspace. Military airspace use impacts would remain minor.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Impacts as a result of the implementation of Alternative 1 would be beneficial. The use of airspace would not change significantly with the loss of ground units as a result of this alternative. Aviation and UAS would continue to require airspace to support training. This implementation of Alternative 1 would result in a slight and marginally lower utilization rate of existing military airspace as some units with UAS may be inactivated and no longer require activation and use of the airspace. No range expansion projects would occur as a result of Alternative 1. Thus, no modifications to controlled or SUA is anticipated for additional restricted airspace to support surface danger zones over new ranges. Training involving the use of munitions, weapons systems, and ranges that require SUA would occur at reduced levels. Reduction in training would likely result in less utilization of SUA by the Army. Thus, adverse impacts associated with closures of certain SUA would be reduced and this would be a beneficial impact to members of the general aviation community. Maneuver training would occur at reduced levels, potentially resulting in less closures of SUA over military lands.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be an anticipated minor impact to airspace as a result of the implementation of Alternative 2. The increased use of airspace would likely remain unchanged or could change with a negligible increase. Additional airspace would not be required, and scheduling, activation, and utilization of existing military airspace (SUA) would proceed as it currently does without

change. Maneuver training of these ground-based units would have no effect to airspace at USAG FWA. Additional airspace is not required to accommodate the types of ground-based maneuvers associated with the proposed growth.

4.21.4 Cultural Resources

4.21.4.1 Affected Environment

Interior Alaska has been continuously inhabited for the last 14,000 years and evidence of this continuum of human activity has been preserved within and around USAG FWA's training lands. Interior Alaska's ice-free status during the last glacial period provided a corridor connecting the Bering Land Bridge and eastern Asia to North America. This allowed small bands of nomadic peoples to colonize Alaska and the rest of the continent and began a period of habitation in Interior Alaska that has persisted through the entire Holocene, the arrival of European traders in the late 1810s, the Klondike gold rush of the late 19th and early 20th centuries, and the military development of the Interior during the middle of the 20th century. USAG FWA's cantonment and training lands comprise a vast and still relatively un-surveyed region with areas of high potential for yielding evidence of this activity.

Alaska has long been regarded as the gateway to the Americas and has held archaeological interest as the possible location for the oldest archaeological sites in the New World. This is due to more than Alaska's proximity to Asia and ice-free condition at the end of the Pleistocene. Similarities between archaeological assemblages in Siberia and Alaska and the discovery of lanceolate projectile points in the muck deposits around Fairbanks in the early 1900s (which bore a resemblance to Clovis points of some antiquity in the American southwest) also sparked interest in Alaska as a source area for all Native Americans.

After initial colonization, archaeologists generally divide Interior Alaska's prehistory into three broad archaeological themes: the Paleoarctic Tradition (12,000-6,000 years ago), the Northern Archaic Tradition (6,000-1,000 years ago), and the Athabaskan Tradition (1,300-800 years ago). Archeological materials from these cultures are generally limited to lithic artifacts such as projectile points, cutting tools, scrapers, waste flakes from tool manufacturing, faunal remains, and hearths.

Interior Alaska's history is divided into four historic themes according to the types and levels of Euro-American activities. These are the Early Contact history (1810s to 1880s), Gold Rush (1880s to 1928), Development of Infrastructure (1890s to 1910s), and Military Activities (1890s to present).

Known sites in Interior Alaska have been identified predominantly through discoveries by area residents and road construction crews, and other chance discoveries. Consultation with Alaska Native Tribes to identify TCP's or other sites of cultural or sacred significance has been on-going. Efforts have been made to document these sites, utilizing input from indigenous land users. To date, one report has been produced to document the lands at DTA. The next area of study would include all other Interior training lands.

USAG FWA and its training lands contain 636 known archaeological sites and four archaeological districts. Sixty sites are eligible for the NRHP, 512 sites have not been evaluated, and 64 additional sites have been determined ineligible for the NRHP. Of the eligible or un-evaluated sites, 13 are historic sites and 559 are prehistoric sites.

In 2011, CEMML completed a survey of the entire cantonment, north and south of the Chena River, discovering one additional historic site. Of the 11 archaeological sites known from the USAG FWA cantonment, 2 have been determined not eligible. The remaining sites have not yet been evaluated.

In total, archaeologists have identified 147 archaeological sites in the TFTA. Of these sites, 11 have been determined eligible for inclusion in the NRHP, 2 are not eligible, and 134 remain to be evaluated for eligibility.

Twenty-one archaeological sites have been identified in the YTA. Ten of the sites have been determined not eligible for listing in the NRHP and 11 have not been evaluated, one of which will not be evaluated due to its location in a heavily used portion of the Stuart Creek Impact Area.

To date, 454 archaeological sites have been identified within DTA. Forty-nine sites have been found to be eligible for the NRHP, and 50 were found not eligible. An additional 355 sites remain to be evaluated. Historic archaeology sites are poorly represented in this region, with only six currently known to exist. The Donnelly Ridge District encompasses Denali sites identified by Frederick West, south and west of Donnelly Dome.

The Gerstle River and Black Rapids Training Area, also managed by USAG FWA, have been infrequently utilized by training activities, and very few surveys or identification of archaeological sites have occurred in these areas. CEMML archaeologists surveyed two small portions of the GRTA in 2011. One prehistoric site is previously known from this training area. Two sites, which have not been evaluated for the NRHP, have been discovered in the Black Rapids Training Area.

Architectural Surveys. The National Park Service conducted the first building survey of USAG FWA in 1984. This survey was conducted as part of the process to identify extant buildings associated with the World War II era Ladd Field. This survey resulted in the designation of Ladd Field as a NHL.

The entire USAG FWA main post has been inventoried and evaluated for eligibility for inclusion in the NRHP under the World War II and Cold War historic contexts. Under the World War II context, Ladd Field has been designated a NHL. The Ladd Field NHL includes 37 buildings and structures centered on the runways.

Under the Cold War context, the main post has been inventoried and evaluated with 70 buildings and structures centered on the runways contributing to the Ladd Air Force Base Historic District. This Historic District was determined eligible for inclusion in the NRHP but not formally nominated or listed.

A survey of range structures in the TFTA was conducted in 2001 and none were evaluated as eligible for listing on the NRHP (Price, 2002).

At YTA, two Nike Missile Sites exist; these are Site Mike and Site Peter. Each consists of a Battery Control Area and a Launch Area. Cleanup efforts occurring in the late 1980s and early 1990s precluded these sites for inclusion in the NRHP.

4.21.4.2 Environmental Consequences

No Action Alternative

Impacts to cultural resources under the No Action Alternative would be significant but mitigable. Activities with the potential to affect cultural resources are routinely monitored and regulated in accordance with the USAG FWA ICRMP through the cultural resource management program.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Significant but mitigable impacts are anticipated as a result of the implementation of Alternative 1 at USAG FWA. Building demolition, solid waste disposal, site recapitalization, and repurposing of existing facilities to assist the Army in efficiently managing its infrastructure and

operating costs, while supporting its Soldiers could potentially disturb or damage cultural resources, or could alter properties and districts. Demolition of facilities within USAG FWA's current Historic District and/or NHL may result in an adverse effect. NHPA Section 106 consultation would be required. Any demolition or repurposing activity occurring adjacent to the Historic District and/or NHL may also require additional Section 106 consultation. USAG FWA would avoid potential impacts to cultural resources during planning for potential cantonment area modification. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process. All activity associated with Alternative 1 would occur on previously disturbed ground. Thus, adverse impacts to other cultural resources are unlikely.

Alternative 1 could result in the modernization and re-purposing of outdated range infrastructure to accommodate new training requirements on facilities that are no longer needed by Army units as a result of force reduction. Construction activity would involve grading and re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface during range repurposing activities. Although these repurposing projects would be located on previously disturbed ground, construction activities have the potential to result in damage to yet-to-be discovered cultural resources. USAG FWA would avoid potential impacts to cultural resources during facility planning. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process. The frequency and intensity of maneuver training would decrease as a result of this alternative. All remaining maneuver training would be conducted within the footprint of existing ranges and trails at USAG FWA; however, any impacts resulting from maneuver training to undocumented cultural resources currently not identified would be reduced given the lower amount of Army training occurring as a result of the implementation of Alternative 1.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

This level of growth on USAG FWA is anticipated to have a significant but mitigable impact to cultural resources. Measures are in place to accommodate training to prevent adverse impacts to cultural resources. The types of training conducted by the additional Soldiers would not change, though some training areas on USAG FWA might be used with marginally more frequency or intensity compared with current baseline conditions. The USAG FWA CRM would continue to follow the procedures outlined in the ICRMP in order to protect cultural resources.

Garrison construction supporting Alternative 2 could potentially disturb or damage cultural resources, or could alter properties and districts. Infill construction in the main post and any associated demolition of facilities to make room for new construction within USAG FWA's current Historic District and/or NHL may result in an adverse effect. NHPA Section 106 consultation would be required. Any construction occurring adjacent to the Historic District and/or NHL may also require additional Section 106 consultation. USAG FWA would avoid potential impacts to cultural resources during planning for potential cantonment construction. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process. All construction associated with this alternative would occur on previously disturbed ground. Thus, adverse impacts to other cultural resources are unlikely.

Negligible impacts from live-fire training are anticipated. Range expansion and new targetry would be sited to avoid cultural resources at USAG FWA following identification of these sites during cultural resource surveys. The frequency and intensity of maneuver training would slightly increase under Alternative 2. As a result of the implementation of Alternative 1, all

maneuver training would be conducted within the footprint of existing ranges and trails at USAG FWA; however, undocumented cultural resources currently not identified could be impacted through maneuver training. Stationing scenarios involving Combat Support units, particularly engineer or combat engineer units, may involve some surface excavation, which could potentially uncover or damage undocumented cultural resources. If impact could not be avoided, measures to minimize or mitigate adverse impacts to cultural resources would be implemented through the NHPA Section 106 consultation process.

4.21.5 Noise

4.21.5.1 Affected Environment

The majority of the area surrounding the USAG FWA training sites are relatively remote and are either undeveloped or have low-density populations. The principle source of operational noise occurs at the USAG FWA main post area and is generated through aviation activity and small arms live-fire training and qualification.

At USAG FWA main post, aviation activity contours indicate that there are some noise sensitive land uses within the NZs. Though the NZ III at Ladd Army Airfield is contained within the installation, beyond the eastern boundary, there is a small privately owned off-post residential area (Secluded Acres) east of the airfield that is within NZ II. Additionally, there is potential for individual events to possibly generate noise complaints. The noise from small arms training at the main post area may be audible in noise-sensitive areas beyond the boundary. Though the NZ III does not contain any non-recommended sensitive land uses, the small caliber NZ II outside of USAG FWA has the potential to impact multiple residences. The noise impact from large caliber and explosive training is generally contained within the installation. The NZs are relatively localized to the ranges on post. The contours indicate that annual average noise levels are compatible with the surrounding environment. Yet, there is potential for individual events to cause annoyance and possibly generate noise complaints. Dependent upon weather conditions, there is a low-to-moderate risk of complaints due to large caliber weapons and explosion training.

The noise levels from training at TFTA are compatible with Army guidelines. Due to the limited number of operations, the NZs do not extend beyond the impact area. The isolated location of the TFTA makes it unlikely that individual events would generate noise complaints. The noise levels from large caliber activity at YTA are compatible with the nearby land uses at Eielson Air Force Base. The NZs do not extend into any noise sensitive land use areas either on or off base. The isolated location of the YTA ranges makes it unlikely that individual events would generate noise complaints either on or off base. The noise levels from training at the small caliber ranges at DTA East and West are compatible with Army guidelines.

The noise levels from the large caliber weapon training at the Donnelly West Training Area are compatible with Army guidelines. Due to the size of the DTA, the NZs for the demolition and large caliber weapons do not extend beyond the ranges and impact areas; however, under unfavorable weather conditions, the demolition and large caliber weapons have a low to moderate risk of generating noise complaints in the non-military parcel of land and on post. The noise levels from training at Black Rapids training area are compatible with Army guidelines. The NZs do not extend beyond the boundary. There are currently no noise generating operations at GRTA.

4.21.5.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in minor noise impacts from aviation, field artillery firing, and live-fire and maneuver training. Noise generating activities would occur with no change to current frequencies or intensities of noise generating activities.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Impacts from noise are anticipated to be beneficial as a result of the implementation of Alternative 1. Existing ranges would still be utilized for firing the same types of weapons systems and conducting the same types of training, however, as a result of the implementation of Alternative 1, USAG FWA would experience an anticipated reduction in the frequency of noise generating training events. The number of weapons qualifications and maneuver training events could be anticipated to decrease. Noise impacts would likely remain comparable to current conditions, though less frequent leading to a reduced risk of noise complaints. The current frequency of aviation training activities, a contributor of noise at the installation, would not be anticipated to change more than marginally, as aviation units would not be impacted by these decisions.

Impacts from building demolition, site recapitalization, and the repurposing of existing facilities to accommodate different Army needs would be temporary. A decreased frequency of noise generating events would correspond to the decreased maneuvers resulting from Alternative 1 to include noise effects that would be produced from convoy travel on public roads.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be an anticipated minor impact on the installation and surrounding communities by the stationing of up to 1,000 Combat/Combat Support Soldiers. Noise modeling has indicated that the frequency of training and live-fire events would need to increase dramatically to result in a change in noise contours that would noticeably increase impacts for sensitive receptor populations. Given that there are no new types of activities that would occur as a result of stationing of these Soldiers, just an increase in the types of existing noise generating activities, only minor impacts are anticipated to occur as a result of implementing this alternative.

Impacts from garrison construction would be temporary. Noise associated with construction would result mainly from the movement of vehicles and equipment. Noise associated with construction equipment generally produce noise levels of 80 to 90 dBA at a distance of 50 feet. Permissible noise exposures identified by the OSHA (29 CFR 1910.95) for an 8-hour work day is 90 dBA; therefore, construction noise in the cantonment area would likely be compliant with these levels. The zone of relatively high construction noise may extend to distances of 400 to 800 feet from major equipment operations. Locations that are more than 1,000 feet from construction sites generally do not experience significant noise levels; however, temporary noise impacts may occur to wildlife. These effects are discussed in Section 4.21.7.

If any training range construction were required, it would result from the movement of construction vehicles and equipment. Significant effects are not anticipated to the public due to distance from expansion locations to off-post communities. Temporary noise impacts; however, may occur to wildlife. This would be discussed in Section 4.21.7, Biological Resources.

Stationing of up to 1,000 Soldiers would increase the frequency of noise generating events. The frequency of live-fire events that generate noise may increase by 10 to 20 percent for 1,000 Soldiers. Because units would be using the same weapons systems as are currently being used during live-fire training at the installation, the types of noise would not change; however,

the number of noise generating events would increase. Residential areas located in the vicinity of the range complex may experience an increase in noise events. Due to the limitations on development near the installation, coupled with an approximate distance of 656 feet between the nearest civilian facility to the small arms range complex at USAG FWA, the effect from increased live-fire activities at the small arms range complex is anticipated to be minor. At DTA, there may be some anticipated noise effects to wildlife from use of firing points along the Delta River where bison, caribou and moose are known to inhabit.

The Army would continue to inform Delta Junction and local residents about live-fire training operations. There have been no significant impacts to these residences from Army-generated noise in the past.

Although there would be an increase in Soldiers maneuvering, the type of noise would be consistent with ongoing maneuver activities. The increased frequency of noise generating events would correspond to the increased maneuvers associated with these stationing alternatives (10 to 20 percent). The noise effects that would be produced from convoy travel on public roads (when traveling between installations and maneuver sites) would be short term as these activities are intermittent and are usually mitigated through SOPs for convoy maneuver.

4.21.6 Soil Erosion

4.21.6.1 Affected Environment

The soils at the USAG FWA are poorly developed, mainly as a result of the cold climate and the relatively young age of parent materials (compared to elsewhere in the U.S.). Swanson and Mungoven (2001) characterized the soils based on their parent material properties, consisting of alluvium, loess, and bedrock. The soil surface generally contains an organic layer of peat (made up of decaying plant and animal matter) built up on cold and wet soils. The cold temperatures for much of the year inhibit decomposition.

USAG FWA conducts both planning level soil surveys and soil resource monitoring. The first program, planning level surveys, inventories the soil and topography resources present across the entire installation. The ITAM program conducts annual monitoring of soils and vegetation through the RTLA program. Current and past disturbance resulting from military training and recreational use is delineated and quantified in terms of “land condition.” Annual RTLA reports detail the levels of disturbance and land condition on USAG FWA. Soil resources management for Interior Alaska sites consists primarily of prevention activities and actual restoration of disturbed areas. The ITAM Five Year Management Plan contains BMPs, which are utilized in conjunction with installation stormwater pollution prevention techniques. Restoration of disturbed areas is conducted through installation management erosion control and streambank stabilization programs, as well as through the LRAM program (USAG Alaska, 2007 - 2011).

The USAG Alaska INRMP (2007 - 2011) indicates that the military impact is greatest on soil productivity in the USAG FWA main post area due to construction. Soil disturbance has been minimally found around small arms ranges, roads, and other facilities; however, the soils at Stuart Creek Impact Area in the YTA have been exposed to erosion as a result of military activities and construction. Army activities have had limited impact on soils at USAG FWA. Throughout the post, the presence of permafrost produces a higher bearing strength to soils when they are frozen; but when those soils have thawed, they experience compaction problems and rutting which can increase sheet and rill erosion. The presence of permafrost and loess, which has very small pore space, works to inhibit drainage and may lend to a very low bearing strength when those soils are thawed. In addition to the garrison’s INRMP, detailed information on the characterization of soils at USAG FWA may also be found in the *Ecological Land Survey for Fort Wainwright* (Jorgenson et al., 1999).

The soils at TFTA have been formed from various unconsolidated materials. These soils are distributed in elongated meander scars and in broad basins. Generally, coarse gravel may be found at the heads of alluvial fans where soils are well drained; and sand and silt can be found at the base of alluvial fans where soils are poorly drained. The permafrost layer there may lie approximately as low as 20 inches below the soil surface and may be as thick as 128 feet. Permafrost is not present beneath the rivers and lakes but generally exists where there is an absence of surface water or circulating groundwater. TFTA is more frequently used for maneuver training during winter because the presence of snow acts as a protective layer against impacts to permafrost. TFTA has both continuous and discontinuous areas of permafrost. The permafrost layer is susceptible to thermokarst as a result of disturbance of surface soils and vegetation removal.

At YTA, the south slopes of mountains consist of soils that are well drained and composed mainly of silt and loams (generally free of permafrost). Where the silt loams may be shallow near ridge tops and mid-slopes, they may be deeper on lower slopes. The bottoms of depressions have shallow gravelly silt loam covered with a thick layer of peat underlain by permafrost. YTA is located in a discontinuous permafrost zone where perennially frozen soils are widespread. Permafrost may be absent on hill tops and south-facing mountain slopes. Similar to TFTA, areas of unfrozen ground lie beneath large waterbodies.

A comprehensive soil survey was completed for DTA in 2005. Glacial and alluvial processes, as well as isolated discontinuous patches of permafrost, primarily formed soils in the DTA. Generally, soils at DTA are derived from glacial actions and modified by streams and discontinuous permafrost. Soils in the northern, west-central, and eastern portions of DTA are silt loam associations, while DTA East is predominantly shallow silt loam over gravelly sand. Soils in the river floodplains consist of alternate layers of sand, silt loam, and gravelly sand. Highly organic wet soils, underlain by permafrost, and having a high water table characterize muskeg soils. Upland foothills have moist, loamy soils, while mountain soils are rocky, steep, and unvegetated (USAG Alaska, 2007 - 2011). Soils on river floodplains in the DTA comprise alternate layers of sand, silt-loam, and gravelly sand. Floodplain soils are known to have moderate erosion potential, while foothill soils have moderate to high erosion potential. Permafrost is found in irregular patches throughout a large portion of the DTA, particularly in morainal areas where slope and aspect change abruptly (Jorgenson et. al., 2001). Predicting permafrost in the DTA is difficult due to heterogeneous soil types, topography, and microclimate variability. Areas containing existing and abandoned river channels, lakes, wetlands, and other low-lying areas tend to be free of permafrost. Known isolated patches of permafrost are found from 2 to 40 feet below ground surface, with thicknesses varying from 10 to 118 feet, underlying sandy gravel in the alluvial plains. Permafrost controls groundwater movement in these areas.

4.21.6.2 Environmental Consequences

No Action Alternative

Minor adverse impacts are anticipated under the No Action Alternative. USAG FWA would continue its infantry and mechanized Stryker training, to include impacts to soils from removal of or damage to vegetation, digging activities, ground disturbance from vehicles, and ammunition or explosives used in training events. The installation's ITAM program conducts monitoring, rehabilitation, and maintenance and repair on areas of high use such as drop zones, artillery firing positions, observation points, and ranges.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Impacts from soil erosion are anticipated to be minor. Alternative 1 includes the reduction of no longer needed facilities that could result in short-term adverse impacts from demolition and temporary exposure of bare soils to rain and water and wind erosion; however, these impacts would be short term in duration. Exposed areas of soil after demolition would likely be reseeded with native species to reduce the impacts from fugitive dust. Consequently, minor soil erosion impacts from deconstruction activities at USAG FWA are anticipated.

The number of required live-fire user days per year at USAG FWA would drop below current levels. Weapons firing can involve the disturbance of vegetation and soils, which can cause increases in soil erosion rates. Implementation of the INRMP and ITAM program work plans and associated management practices, along with additional soil erosion mitigation measures would continue. Consequently, impacts to soil erosion from a reduction in live-fire training would be negligible to minor impact as fewer opportunities for soil erosion would occur.

The intensity and frequency of maneuver training at USAG FWA would also decrease below current levels. In addition, no new maneuver areas would be required and maneuver training would be conducted in the footprint of existing ranges and trails at USAG FWA. Implementation of the INRMP and ITAM program work plans and associated management practices along with additional soil erosion mitigation measures would continue. Consequently, impacts to soil erosion from a reduction in live-fire training would be minor.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Minor impacts to soil resources at USAG FWA are anticipated resulting from the implementation of Alternative 2. Alternative 2 would involve the demolition of some facilities and construction of new facilities within the existing cantonment area resulting in short and long-term minor impacts. Short-term impacts would occur as infill among existing structures within the main cantonment area where stormwater management practices may already be in place to mitigate potential adverse effects from sediment runoff. Fugitive dust may also occur, but impacts from dust would likely to be localized and not have any lasting adverse effects to nearby waterbodies. Long-term effects could occur from the compaction of soils, reducing the likelihood for vegetation to re-establish itself and increasing the effects from wind erosion or precipitation. Soils transported away from the construction area may accumulate in gullies or to other areas where post-precipitation event water may carry sediments to other waterbodies. Other direct long-term effects would include a change in soil function due to permanent modification of the area (construction of a building on top of previously undisturbed soil).

Range construction and expansion projects would have similar impacts to soils as would cantonment construction. Heavy construction machinery or vehicles would disturb the soil surface through excavation, digging of wheels into the surface media, and physically moving soils from place to place. Short-term effects would occur from soil transport and loading into nearby waterbodies. Fugitive dust may also occur; however, impacts from dust would likely be localized and not have any lasting adverse effects to nearby waterbodies. Due to the relatively high occurrence of surface water and wetlands at DTA, construction may need to occur in the wintertime to mitigate any adverse effects from soil transport. Long-term minor direct effects would occur from the loss of vegetation, exposing the soils beneath; and may also include the compaction of some soils making it difficult to support future vegetative growth; and permanent modification of soil function. The installation would continue to use existing construction BMPs to mitigate any potential effects.

Implementation of Alternative 2 would increase the frequency of live-fire activities on ranges, potentially causing a greater amount of soil disturbance. Weapons firing typically involve the disturbance of soils, denuding the soil surface of vegetation and increasing the erodibility of soils. USAG FWA DPW staff monitors impacts from live-fire activities and would continue to institute the required mitigations and BMPs (such as berm revegetation and regrading) to minimize sediment migration off the firing ranges.

For Combat Support units, the use of ordnance or explosives could cause wildfires resulting in the removal of vegetation that normally protects soil from erosion. The presence of vegetation slows surface water runoff by intercepting raindrops before they reach the soil surface, and works to anchor the soil with roots. Without surface vegetation, the top layer of soils may be transported away due to natural processes, and the soil remaining may become compacted leaving little opportunity for vegetation to re-establish itself. Vegetation removal resulting from wildland fires could result in increased soil erosion by water and wind, indirectly causing large-scale removal and redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. The impact would be directly proportional to the size of the fire. Fuel maps were created indicating concentrations of fire-prone vegetation and areas recommended for hazard fuel reduction projects; these may be found in the 2004 *USARAK Transformation EIS*.

Units operating at impact areas in the summer can directly create craters and remove patches of vegetation, which normally protect soil from erosion by slowing runoff, intercepting raindrops before they reach the soil surface, and anchoring the soil. Compaction in the craters caused by larger ordnance explosions can alter the permeability and water-holding capacity of the soils affecting the ability of vegetation to recover in those areas. These direct impacts indirectly create large areas of bare ground and exposed soils that are susceptible to wind and water erosion, which can indirectly cause large-scale removal and redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. Although weapons training events would be periodic, long-term impacts are anticipated because soil disturbance typically requires time and effort to amend.

The addition of 1,000 Soldiers may increase the frequency of maneuvers by 10 to 20 percent. The increase in maneuver frequency is anticipated to correlate with resulting damage to vegetation and disturb soils to an extent that would increase soil erosion rates and alter drainage patterns in the training areas. This could lead to gullying, and indirectly to downstream sedimentation, particularly when the vehicles travel off-road.

Alternative 2 involves travel on existing roads and trails that is anticipated to lead to very limited new soil erosion impacts. Activities associated with any Combat Support units could have adverse impacts to off-road areas that may include the use of heavy construction equipment and explosives to clear land and obstacles for training. Direct effects may occur from removal of vegetation and soil displacement or disruption. These activities may indirectly impact the permafrost layers.

Between USAG FWA's main post and its training areas (DTA, TFTA, and YTA) the installation has more than 1 million maneuver acres and is capable of handling brigade-level training; and more than capable of handling maneuver associated as a result of this alternative. The Army has developed a methodology for estimating the collective impact of all mission and training activities (training load) on soil erosion on a specific parcel of land. The methodology uses a measure called MIM, and it is calculated using a series of factors that assess the impact of a training event. At certain locations, the anticipated MIM requirement associated with a growth scenario would slightly exceed the MIM summer capacity. However, MIMs and training would be spread over a large land areas and training area use would be rotated if necessary to reduce maneuver damage to soils, resulting in a negligible to minor impact.

Training maneuvers in Alaska are often conducted more frequently in the winter months when the ground is frozen to reduce impacts from soil erosion and to waterbodies. The USAG FWA has BMPs in place to avoid impacts to permafrost, these include avoiding areas where permafrost is known or thought to occur during warmer weather conditions, and the limitation of maneuver over permafrost to wintertime when snow depth is sufficient enough to ensure an insulating layer can support maneuver while maintaining the integrity of the permafrost below.

The USAG FWA is currently undertaking a project to improve roads and trails at DTA East. Currently, DTA West can only be accessed via vehicle in the winter because there is no bridge across the Delta River that would allow year-round access. The USAG FWA also currently maintains a maneuver corridor that connects DTA West with TFTA, but generally it is used during the winter.

Maneuvers may occur more frequently at TFTA during wintertime when soils are less affected. While maneuver could disrupt soil surfaces, training in TFTA would most likely occur when the ground is frozen and a layer of snow is covering the ground that would protect the soil surface and could act as an insulating layer against adverse effects to permafrost.

YTA is generally used year-round for light vehicle maneuver. Long-term effects may occur as more vehicles on the ranges there may dig into soils, disrupting the surface and removing vegetation. The ITAM program in conjunction with regular range maintenance would prevent this from occurring. Wintertime training is supported there for most other vehicle maneuver. Although rutting and disruption to soils is less significant during the colder temperatures, the potential exists for some damage to occur to vegetation, which may have indirect impacts to the permafrost layer below.

During summer months, there is a great deal more open or standing water located on USAG FWA. During the warmer seasons the risk of sediment transport and loading to waterbodies on the installation is much greater. In many areas, maneuver is reduced or restricted to minimize or eliminate effects of training to water and to the soils underlain with permafrost. The amount of land available on which to train is reduced significantly in some areas during the summer months.

4.21.7 Biological Resources (Vegetation, Wildlife, Threatened and Endangered Species)

4.21.7.1 Affected Environment

***Vegetation*.** Vegetation inventory efforts are accomplished by conducting comprehensive "fence line-to-fence line" flora and vegetation community planning level surveys. Vegetation monitoring is accomplished through the RTLA program. USAG FWA conducts a baseline floristic survey at least once every 10 years to identify all vegetative species that occur on all USAG FWA lands. Floristic inventory activities set the foundation on which many decisions regarding land management are based.

A comprehensive survey of rare plants was included as part of the floristic inventory for USAG FWA conducted in 1995, and released in 1996, indicated that there were no federally-listed endangered or threatened plant species on USAG FWA. The survey report indicated that there are 491 plant species identified by the inventory, of which 16 species are currently recognized as "rare" by the Alaska Natural Heritage Program. A floristic survey of DTA was conducted in 1997. There are 497 plant species identified of which 17 species are currently recognized as "rare" by the Alaska Natural Heritage Program. Two plant species are ranked in USAG FWA short-list of Species of Concern for ecosystem management; these are the *Carex sychnocephala,* which is rare and critically imperiled in Alaska; and the *Dodecatheon pulcchellum pauciflorum*.

USAG FWA has four vegetation types: moist tundra; treeless bogs and fens; open, low-growing spruce forests; and closed spruce-hardwood forests. The white spruce-paper birch forest of Interior Alaska is often called the boreal forest or taiga. Higher elevations on north-facing slopes are dominated by Black spruce; these are also found on lower hydric slopes. Above the treeline is generally considered barren or tundra and are dominated by sedges and mosses on hydric soils and scrub birch and willow shrubs on arid sites.

A more detailed ecological classification of vegetation in Alaska; forest management goals and objectives and responsibilities; and a listing of flora identified throughout USAG FWA lands may be found in USAG FWA's 2007-2011 INRMP.

Fish and Wildlife. Wildlife throughout USAG FWA and its training areas include a variety of mammals and avian species including migratory birds. A greater discussion of the wildlife found on lands throughout USAG FWA may be found in Appendix E of the 2004 *USARAK Transformation EIS* (USARAK, 2004).

Priority wildlife species include the wolverine, grizzly bear, caribou, wolf, bison, moose, the Sandhill crane, waterfowl, raptors, the Gyrfalcon, White-tailed ptarmigan, Sharp-tailed grouse, Great gray owl, Boreal owl, black-backed woodpecker, American dipper, Hammond's flycatcher, Bohemian waxwing, Rusty blackbird, and the White-winged crossbill. More information on Priority species found throughout USAG FWA's cantonment and range areas are found in Section 4.10 of the 2004 *USARAK Transformation EIS* (USARAK, 2004).

No federally-listed threatened and endangered species are found on USAG FWA or its training areas; however, these areas do support priority species and Species of Concern or sensitive species. Priority bird species found at Interior Alaska sites (as identified by the Boreal Partners in Flight Working Group (1999)) are listed in Table 3.9.c of the 2004 *USARAK Transformation EIS* (USAG, Alaska 2004). Table 4.21-2 lists the Species of Concern found on USAG FWA's training areas (TFTA, YTA, DTA, GRTA); the list also includes species of management concern listed here due to the hunting interests by outside groups (USARAK, 2008).

Table 4.21-2. Species of Concern found on U.S. Army Garrison Fort Wainwright Training Lands

Training Area	Group	Species	Scientific Name
Tanana Flats Training Area	Bird	Alaska Sharp-tailed Grouse	*Tympanuchus phasianellus caurus*
	Bird	Great Gray Owl	*Strix nebulosa*
	Mammal	Wolverine	*Gulo gulo*
	Bird	Olive-sided Flycatcher	*Contopus cooperi*
	Bird	White-winged Scoter	*Melanitta fusca*
	Bird	Rusty Blackbird	*Euphagus carolinus*
	Bird	Western Wood-Pewee	*Contopus sordidulus*
	Bird	Red-winged Blackbird	*Agelaius phoeniceus*
	Bird	Yellow-bellied Sapsucker	*Sphyrapicus varius*
	Bird	Barrow's Goldeneye	*Bucephala islandica*
Yukon Training Area	Bird	Great Gray Owl	*Strix nebulosa*
	Mammal	Wolverine	*Gulo gulo*
	Bird	Olive-sided Flycatcher	*Contopus cooperi*
	Bird	White-winged Scoter	*Melanitta fusca*
	Bird	Western Wood-Pewee	*Contopus sordidulus*

Training Area	Group	Species	Scientific Name
	Bird	Yellow-bellied Sapsucker	*Sphyrapicus varius*
	Bird	Barrow's Goldeneye	*Bucephala islandica*
	Bird	Blackpoll Warbler	*Dendroica striata*
	Bird	Great Horned Owl	*Bubo virginianus*
	Bird	Black Scoter	*Melanitta nigra*
Donnelly Training Area- East	Mammal	Wolverine	*Gulo gulo*
	Bird	Boreal Owl	*Aegolius funerereus*
	Bird	White-tailed Ptarmigan	*Lagopus leucura*
	Bird	Surfbird	*Aphriza virgata*
	Bird	Wilson's Snipe	*Gallinago delicata*
	Bird	Spruce Grouse	*Falcipennis canadensis*
	Bird	Sandhill Crane	*Grus canadensis*
	Bird	Upland Sandpiper	*Bartramia longicauda*
	Bird	Olive-sided Flycatcher	*Contopus cooperi*
	Mammal	Lynx	*Lynx canadensis*
Donnelly Training Area - West	Mammal	Wolverine	*Gulo gulo*
	Bird	Rusty Blackbird	*Euphagus carolinus*
	Bird	Boreal Owl	*Aegolius funerereus*
	Bird	Great Gray Owl	*Strix nebulosa*
	Bird	Wilson's Snipe	*Gallinago delicata*
	Bird	Spruce Grouse	*Falcipennis canadensis*
	Bird	Sandhill Crane	*Grus canadensis*
	Bird	Upland Sandpiper	*Bartramia longicauda*
	Bird	Olive-sided Flycatcher	*Contopus cooperi*
	Mammal	Lynx	*Lynx canadensis*
Gerstle River Training Area	Bird	Trumpeter Swan	*Cygnus buccinator*
	Mammal	Wolverine	*Gulo gulo*
	Bird	Rusty Blackbird	*Euphagus carolinus*
	Bird	Boreal Owl	*Aegolius funerereus*
	Bird	White-tailed Ptarmigan	*Lagopus leucura*
	Bird	Great Gray Owl	*Strix nebulosa*
	Bird	Surfbird	*Aphriza virgata*
	Bird	Wilson's Snipe	*Gallinago delicata*
	Bird	Spruce Grouse	*Falcipennis canadensis*
	Bird	Sandhill Crane	*Grus canadensis*
Species of Management Concern	Moose	These species are a separate list due to hunting interests by outside groups.	N/A
	Caribou		N/A
	Bison		N/A
	Dall Sheep		N/A
	Black Bear		N/A
	Brown Bear		N/A
	Wolf		N/A

Training Area	Group	Species	Scientific Name
	Sharp-tailed Grouse		N/A
	Ruffed Grouse		N/A
	Grayling		N/A

N/A = not applicable

Wildland Fire Management. Fire management on USAG FWA is required by the Sikes Act and by AR. Fire management plans are required by the Resource Management Plan, which is mandated under Public Law 106-65, the Military Lands Withdrawal Act. Additional direction regarding fire management is stated in a 1995 Memorandum of Understanding between the BLM and USAG FWA, as well as in the Army wildland fire policy guidance document (U.S. Army, 2002a).

These agencies developed inter-service support agreements that establish the Alaska Fire Service's responsibility for all fire detection and suppression on military installation lands (Alaska Fire Service and USAG Alaska, 1995). In exchange, the Army provides the Alaska Fire Service the use of buildings, utilities, training services, air support, and other support services.

As a part of the Alaska Wildland Fire Management Plan, which is reviewed annually, certain areas have certain fire management designations that allow the land-owners to establish fire management options (these are Critical, Full, Modified, Limited) for their lands. These are based upon the risk of wildfires to those areas, the potential for damage to occur, and the amount of monitoring required. Additional fire management option categories have been developed specifically for lands managed by USAG FWA; these include Unplanned Areas that are not officially designated but may receive service similar to the full management option (maximum detection coverage, notification, fire suppression strategies, etc.); and the Restricted Areas (Hot Zones) that include impact areas and other locations where no "on the ground" fire fighting can be conducted due to the presence of UXO or other safety hazards.

Fire-prone areas take into consideration the type of vegetation, climate, and human activity. Common "fuels" or stands of vegetation susceptible to wildfire include: Black Spruce, White Spruce, Mixed Spruce with hardwood stands, Bluejoint Reedgrass, and Tundra. For the areas on ranges that could be impacted, the installation generally uses prescribed burns and vegetation thinning to minimize the risk of wildfire.

Most of DTA West is classified for Limited fire management because few resources are at risk from fire, and USAG FWA recognizes that fire is a natural process in ecosystem function (Alaska Wildland Fire Coordinating Group, 1998). A private hunting lodge, located along the extreme western boundary of DTA West, is given full fire suppression status. The northern boundary of DTA West is classified for Modified fire management to provide a buffer to adjacent state lands that are classified under full management status. DTA West is bounded by private parcels and state lands (USAG Alaska, 2002).

DTA East is a Full fire management area due to the close proximity of the community of Delta Junction. This area is subject to high winds and extreme fire behavior, further supporting the Full fire suppression status. The Army does have structures at risk throughout DTA East. These resources have been identified and mapped. DTA East is bounded by allotments, private parcels, and state lands, including a portion of private and state land known as the "Key Hole" (USAG Alaska, 2002).

Fires are common at DTA. Fifty-nine percent of DTA has burned since 1950, and a considerable portion has burned more than once (Jorgenson et. al., 2001). Approximately 16 percent of DTA

has burned within the past 30 years, and, based on fires recorded on the installation since 1950, 1.2 percent of the area has burned annually. From 1980 to 2000, 89 fires were reported at DTA (USAG Alaska, 2002). Of these, 78 were caused by humans and 11 were due to natural causes. Eighty-eight percent of all reported fires were caused by military training activities. Two large fires occurred between 1997 and 2000. The first was a 2,500-acre fire caused by lightning in 1997, and the second was a 53,720-acre fire in 1998. The average interval for recurrence of fire for any given area varies from 100 to 150 years (USAG Alaska, 2002). In 1999, the Donnelly Flats fire burned approximately 18,000 acres of DTA East and main post.

Recent fuels management projects on DTA include the removal of dead spruce, the creation of a fuel break on the northern portion of DTA East, and a 3,000-acre prescribed burn on Texas Range. These projects reduce fuels by removing highly flammable spruce and promoting regeneration of less flammable hardwoods.

Subsistence Activities. USAG FWA training areas are located in the traditional lands of Tanana and Tanacross Athabascans. While traditional Athabascan settlement patterns focused on a widely mobile and seasonal lifestyle, subsistence activities continue to be integral to the economic and nutritional well being of many households in rural Alaska. Fish and moose are primary dietary resources for residents of Interior Alaska communities near USAG FWA training lands. The fall caribou and moose hunts are pivotal in subsistence preparations for the winter, while summer activities are focused on fish camps, berry/root collecting, and sheep hunting (McKennan, 1981). Fish and moose continue to play a primary role in Interior Alaska communities near USAG FWA training lands. Plant gathering continues to be a focus in the spring, summer, and fall.

Wildlife resources are readily available at Interior Alaska sites. Due to the size and relatively remote locations of these areas, natural resources and wildlife populations are fairly well preserved. All training areas at USAG FWA host a variety of hunting and trapping activities. Customary and traditional use has been determined for the following species: brown bear, moose, beaver, coyote, red fox, hare, lynx, marten, mink and weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan. Subsistence permits can be obtained for the take of these species (2004 *USARAK Transformation EIS* (USARAK, 2004)).

Healy Lake Village residents live a subsistence lifestyle (Alaska Department of Community and Economic Development, 2002). The village is 29 miles east of DTA.

The towns of Delta Junction and Big Delta are located adjacent to DTA at the junction of the Richardson and Alaska highways. These towns are rural and qualify for subsistence preference under current law.

Approximately 45 miles east-southeast of Delta Junction is the nonnative community of Dry Creek. According to the Alaska Department of Community and Economic Development (2002), at least 15 adult residents rely on the exploitation of natural resources and a number of Dry Creek residents can be characterized as subsistence hunters and trappers.

The Dot Lake Village is about 60 miles east-southeast of Delta Junction along the Alaska Highway. Most of the village's historic subsistence harvest areas end at the Gerstle River; however, some residents of Dot Lake travel the extra distance to hunt on DTA (Marcotte, 1991).

Recreational Hunting and Fishing. USAG FWA main post and YTA lie within the Alaska Department of Fish and Game's Game Management Subunit 20B. The TFTA lies within Game Management Subunit 20A. DTA is located within the Game Management Subunit 20A and 20D. DTA hosts annually a variety of hunting activities based on access and available big game populations. A detailed map of Game Management Subunits and the wildlife species available for hunting (and their associated seasons and regulated hunting limits) is found in the Alaska

Department of Fish and Game's 2007-2008 Alaska Hunting Regulations, No. 48 (Regulated by Title 5, Alaska Administrative Code and Title 16 of Alaska Statutes) (Alaska Department of Fish and Game, 2012).

To promote recreational activities, the Alaska Department of Fish and Game produces a "Statewide Stocking Plan for Recreational Fisheries" each year. Most ponds or lakes on USAG FWA main post, TFTA, and YTA do not support fish populations during winter as these lakes freeze completely, or, when iced over they lack sufficient dissolved oxygen for fish to survive through the winter. Sixteen lakes on DTA, ranging in size from 3 to 320 acres, are stocked. Anadromous fish stocks are not available on the training areas, but other freshwater fish can be harvested.

4.21.7.2 Environmental Consequences

No Action Alternative

Minor adverse effects would occur at USAG FWA as a result of the implementation of the No Action Alternative. USAG FWA would continue to adhere to its existing resource management plans and INRMP (2007-2011) to further minimize and monitor any potential effects. Units are briefed prior to each training event regarding sensitive areas on post, such as protected species habitat, and what is and is not allowed within certain areas.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Minor impacts to biological resources are anticipated as a result of the implementation of Alternative 1. Scheduling conflicts for training area access to conduct resource monitoring would be reduced. Proactive conservation management practices and species monitoring would be more easily accomplished with reduced levels of training. The land within the main cantonment area where deconstruction would occur does not support any critical habitat, threatened or endangered species, or Species of Concern. This area is highly disturbed and used by humans daily. Activities associated with demolition actions (increase in vehicles and human presence) creates noise and disturbs wildlife; however, these activities have not shown to be detrimental to foraging behavior or reproductive success, but this observance may vary by location, species, and type of human activity (Holthuijzen et. al., 1990). Habitat destruction could occur for those species habituated to a more urbanized environment; however, wildlife species that may currently habituate these areas (such as some bird species) are likely already adapted to the human presence and may adjust. Consequently, the impacts to wildlife from deconstruction on the garrison are anticipated to be negligible or minor.

Construction vehicles operating in the cantonment area could also spill hazardous materials such as POLs onto the soil surface which could remain in the soils for an extended period of time and may enter groundwater. POLs may also be transported to surface waters with runoff from the construction site. Hazardous materials that enter the soil media and water column may have detrimental effects to the wildlife that inhabit and use these areas. USAG FWA has SWMPs in place to mitigate the effects of sediment and hazardous waste transport.

Impacts to vegetation from deconstruction can include breaking and crushing of plants and direct mortality. This can directly or indirectly alter plant community composition and structure and vegetative cover. Fugitive dust from these construction projects could occur and result in short-term impacts to vegetation. Deconstruction projects would occur in existing, disturbed cantonment areas, and there would be little or no direct impacts to native or sensitive vegetation.

Soils that are disturbed from deconstruction could be transported to surface water; thereby, causing temporary increases in turbidity, and degrading the water quality. Impacts to water

quality have direct effects to the inhabitants (fish, invertebrates) and indirect effects to the wildlife that forage for food in these areas. USAG FWA implements BMPs and SOPs to minimize the impacts from sedimentation into nearby waterbodies. Consequently, the impacts to water quality are anticipated to be negligible or minor.

Recreational activities, subsistence activities, or wildland fire management are not anticipated to be impacted from construction and deconstruction that would occur as a result of Alternative 1.

Recreational activities, subsistence activities, or wildland fire management are not anticipated to be impacted from construction and deconstruction that would occur as result of this alternative.

The number of required live-fire user days per year at USAG FWA would drop below current levels. A reduction in live-fire training related wildfires is anticipated as well as reduced impacts to fish and wildlife and vegetation. Reducing the number of Soldiers stationed at USAG FWA would open up opportunities for more recreational and subsistence activities because training areas would not be closed as often.

The intensity and frequency of maneuver training at USAG FWA would drop below current levels. In addition, no new maneuver areas would be required and maneuver training would be conducted in the footprint of existing ranges and trails at USAG FWA. Reduced impacts to fish, wildlife and vegetation would be similar to that discussed for live-fire training. Reducing the number of Soldiers stationed at USAG FWA would open up opportunities for more recreational and subsistence activities because training areas would not be closed as often.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Minor adverse impacts are anticipated as a result of the implementation of Alternative 2. The increase in the number of Soldiers is less than 15 percent above the current level. While this moderate force augmentation would increase traffic in the training lands and ranges, it would not cause significant degradation or destruction of rare or sensitive species habitats. The land within the main cantonment area where construction and deconstruction would occur does not support any critical habitat, threatened and endangered species, or Species of Concern. Construction would occur as infill within the main cantonment area. This area is highly disturbed and used by humans daily. Habitat destruction could occur for those species habituated to a more urbanized environment; however, wildlife species that may currently habituate these areas (such as some bird species) are likely already adapted to the human presence and may adjust.

Construction activities (increase in vehicles and human presence) create noise and disturbs wildlife; however, these activities have not shown to be detrimental to foraging behavior or reproductive success; but, this observance may vary by location, species, and type of human activity (Holthuijzen et. al., 1990). Construction vehicles operating in the cantonment area could also spill hazardous materials such as POLs onto the soil surface which could remain in the soils for an extended period of time and may enter groundwater. POLs may also be transported to surface waters with runoff from the construction site. Hazardous materials that enter the soil media and water column may have detrimental effects to the wildlife that inhabit and use these areas. USAG FWA has SWMPs in place to mitigate the effects of sediment and hazardous waste transport.

Impacts to vegetation from construction and deconstruction and training can include vegetation shear or clearance. This can directly or indirectly alter plant community composition, structure and vegetative cover, and can lead to increased presence of invasive species. Fugitive dust from these construction projects could occur and result in short-term impacts to vegetation. Construction and deconstruction projects would occur in existing, disturbed cantonment areas, and there would be little or no direct impacts to native or sensitive vegetation. New construction

to the north and in the southeast corner of the installation cantonment area may be needed. Clearing of vegetation and soils may lead to the movement of animals away from the construction site.

Soils that are disturbed could be transported to surface water; thereby, causing temporary increases in turbidity, and degrading the water quality. Impacts to water quality have direct effects to the inhabitants (fish, invertebrates) and indirect effects to the wildlife that forage for food in these areas.

Recreational activities, subsistence activities, or wildland fire management are not anticipated to be impacted from construction and deconstruction that would occur as a result of this alternative.

The removal of native vegetation could result in the introduction of invasive weed or non-native plant species. Equipment and vehicles could introduce these species in tire tread (as seeds) or among construction materials. Management of invasive plant species is an issue of concern on USAG FWA lands. The RTLA program monitors vegetation and documents invasive plant species. These species are managed using integrated pest management techniques, whereby chemical control is minimized.

Construction noise on the USAG FWA lands could temporarily impact wildlife species using these areas for shelter and foraging. Some species of priority, which includes moose and waterfowl could be temporarily driven away due to the construction noise; however, most species would return due to the availability of food and shelter.

An increase in training infrastructure construction may close training areas to recreational activities and subsistence activities for short periods of time. Consequently, these impacts are anticipated to be negligible or minor.

The frequency and intensity of live-fire training in the USAG FWA small arms range complex would increase by approximately 10 to 20 percent. Units would use the same weapons systems that are currently being utilized at USAG FWA and qualitatively noise generating events would be the same. Wildlife using these areas would adjust to any live-fire training modifications and short-term effects are anticipated. These may include the temporary avoidance of live-fire areas and the scattering of smaller mammals when firing is first initiated.

Impacts from live-fire activities would also include the disturbance of soils and vegetation on ranges, increasing the erodibility of soils and requiring more monitoring and maintenance. Live-fire training could increase the frequency of wildfires. Several fire mitigation measures, such as prescribed burning and hazard fuels reduction, are being implemented throughout the USAG FWA on existing ranges and would be continued under all stationing alternatives. USAG FWA is only subject to wildfire risk as certain times of year and this risk is greatly reduced during the winter, spring melt, and fall seasons. In general, the wet conditions reduce the overall fire risk. Impacts to wildland fire management from an increase in live-fire training are anticipated to be negligible or minor.

The TFTA has one of the most dense moose populations in the state. Impact areas within this training area have suitable moose habitat. Many of the ungulate species found throughout Alaska training lands do not avoid live-fire training areas due to the readily available vegetation providing favorable foraging conditions. Direct impacts to moose and other wildlife species would be reduced by practicing avoidance of wildlife when possible in accordance with USARAK regulations (USARAK 350-2).

The increased frequency of live-fire training may also result in restrictions to recreational and subsistence activities on USAG FWA lands. Overall impacts on subsistence may occur

because of the anticipated increase in access closures and the potential disruption or partial migration of wildlife. The USAG FWA would continue to identify areas available to the public and offer access for recreational and subsistence use. Additional personnel stationed at USAG FWA might participate in recreational hunting and fishing activities and could impact current availability of subsistence resources on Interior Alaska lands. An increase in hunting interest would compete with existing recreational hunters. The impacts to recreational activities and subsistence activities are anticipated to be negligible or minor.

The frequency of maneuver training could increase by approximately 10 to 20 percent. Units would support combat maneuver units by providing logistics support, mainly on roads and hardened surfaces. The increase in maneuver mileage would result in relatively minor effects to the existing range road network. Potential direct impacts include damage to soil surface and causing disruption to the permafrost layer below. Disruption of soils may create situations where permafrost melts, resulting in saturated conditions or subsidence. The potential for this occurs on frozen soils particularly when the permafrost is shallow. USAG FWA has BMPs in place to avoid impacts to permafrost, these include avoiding areas where permafrost is known or thought to occur during warmer weather conditions, and the limitation of maneuver over permafrost to wintertime when snow depth is sufficient enough to ensure an insulating layer can support maneuver while maintaining the integrity of the permafrost below. Any impacts to permafrost may considerably alter the landscape and habitat in training areas, but these areas are avoided when possible and limited impacts would be anticipated as Combat Service Support units would mostly use existing roads and trails.

The higher rate of maneuvers may have short-term immediate impacts to wildlife from the additional noise; however, these impacts may be temporary as training with these alternatives would not introduce new types of weapons to the range areas, and would not increase the level of noise above what is heard currently on ranges. As cited above, wildlife would likely quickly adjust to the new training schedules. Wildlife populations would be able to tolerate some disturbance from vehicular traffic; however, information available currently is insufficient to determine the extent of population-wide effects. Wildlife would be closely monitored by USAG FWA's ecosystem management program to understand better the impacts and the extent of disturbance resulting from increased road use.

Increases in maneuver training frequency could temporarily affect the distribution of moose. Moose appear well adapted to multiple use management (forestry, hunting, and military activities), and military training seems no more detrimental to moose populations than other land uses (Andersen et. al., 1996). Impacts to moose populations are potentially significant if winter habitats were degraded; however, moose are readily adaptable to the creation of new early succession habitat.

Maneuver training would also result in negligible or minor impacts to fisheries. Anticipated increases in training levels could lead to higher rates of erosion and sedimentation, as well as an increased potential for petroleum spills during refueling. Implementation of the USAG FWA institutional programs as well as INRMP and ITAM program work plans and associated management practices along with additional soil erosion mitigation measures would continue to ensure soil erosion-related impacts caused by maneuver training would be negligible or minor.

Wildfire ignition from vehicle use and human activity may occur. Mitigation measures currently utilized by the USAG FWA are designed to prepare the landscape for impending wildfires. Patches of thinned trees and controlled burns in high-risk areas may slow wildfire intensity and speed. Impacts to wildland fire management from an increase in maneuver training are anticipated to be negligible or minor.

The increased frequency of maneuver training may also result in restrictions to recreational and subsistence uses of USAG FWA lands. Overall impacts on subsistence may occur because of the anticipated increase in access closures and the potential disruption or partial migration of wildlife. The USAG FWA would continue to identify areas available to the public and offer access for recreational and subsistence use. Additional personnel stationed at USAG FWA might participate in recreational hunting and fishing activities and could impact current availability of subsistence resources on Interior Alaska lands. An increase in hunting interest would compete with existing recreational hunters.

4.21.8 Wetlands

4.21.8.1 Affected Environment

From the years 2000 to 2005, USAG Alaska obtained a permit to conduct training in wetlands at USAG FWA, including its training areas: TFTA, YTA, and DTA. The permit specified that the Army could damage no more than 40 acres of wetlands per year and carried penalties for exceeding that amount. While this permit is no longer in effect, USAG FWA is currently working towards a renewal. In the interim, USAG FWA remains diligent in protecting and preserving these resources.

USAG FWA main post has approximately 6,500 acres of palustrine, riverine, and lacustrine-type wetlands. Wetlands comprise approximately 483,500 acres (74 percent) of the TFTA, and YTA has 42,600 acres (17 percent) classified as wetlands. DTA has an estimated 431,940 acres of wetlands with palustrine, riverine, and lacustrine types identified. The 431,940 acres equates to about 68 percent of the entire DTA.

An environmental limitations overlay has been developed as a tool for planning military training activities and managing wetlands. Each overlay is available for winter and summer training for activities which can or cannot occur. This simplified system assists the Range Control in determining what training areas can be used during a particular season and assists in planning for future training activities. Table 4.21-3 describes the wetland types found at USAG FWA and Interior Alaska training areas. More discussion of wetlands on USAG FWA lands may be found in the USAG Alaska INRMP 2007-2011 and the 2004 *USARAK Transformation EIS* (USARAK, 2004).

Table 4.21-3. Wetland Types Found at U.S. Army Garrison Fort Wainwright and Interior Alaska Training Areas

Wetland Type	Percent of Total Wetlands	Wetland Characterization and/or Location	Vegetation
U.S, Army Garrison Fort Wainwright Main Post			
Palustrine, riverine, lacustrine	42	Bogs, fens, marshes with wide distribution around the post.	Bogs generally are sphagnum, sedge, or sheathed cottonsedge. Understory vegetation is primarily dwarf birch, bog rosemary, Labrador tea, low bush cranberry, and willows.
Tanana Flats Training Area			
Lowland Tussock Bog	3	Poorly drained due to permafrost.	Sites are canopy of shrubs and tussocks of cottonsedge.
Fens	7	Poorly drained.	Vegetation is dominated by floating mats of sedges, grasses, horsetails, herbaceous broadleaf

Wetland Type	Percent of Total Wetlands	Wetland Characterization and/or Location	Vegetation
			forbs. Willows and birches may also be present.
Lowland Wet Needleleaf Forest	25	Wet or loamy organic soils.	Black spruce, white spruce, and occasional tamarack.
Lowland Forest and Scrub Thermokarst Complexes	27	Abandoned floodplains and collapsed bog scars.	Forest, scrub, bog, and fen plant communities.
Riverine and Lacustrine Complexes	9	Moist loamy soils.	Needleleaf, broadleaf, or mixed forests; shrubs; or meadows.
Other Wetlands	3	Various upland ecotypes.	Variety of vegetation.
Yukon Training Area			
Shrub Wetlands	2	Poorly drained soils that may be underlain by permafrost; generally found along South Fork Chena River lowlands, the Stuart Creek Impact Area, and the French Moose Creek area.	Alder and willow.
Lowland Wet Needleleaf Forest	11	Wet loamy soils to organic soils that are slightly acidic and poorly drained; found in low-lying areas and creek floodplains.	Black spruce and ericaceous shrubs.
Wetland Upland Complex	27	Determined that most middle and lower portions of north-facing slopes in the wetland/upland complex of YTA are likely wetlands.	--
Donnelly Training Area			
Alpine Tussock Meadow and Alpine Wet Low Scrub	6	Underlain with permafrost; moderately to strongly acidic. Found above the treeline, primarily in the southern portion of DTA west along the foothills of the Alaska Range.	Sedges, Dwarf birch, Willow, Ericaceous shrubs, and Sphagnum moss.
Lowland Wet Low Scrub and Lowland Tussock Scrub Bog	35	Poorly drained due to permafrost. Found above the treeline, primarily in the southern portion of DTA west along the foothills of the Alaska Range.	Willows, Dwarf birches, Ericaceous shrubs, Black spruce, and Sphagnum moss.
Lowland Wet Needleleaf Forests	12	Poorly drained due to permafrost; moderately acidic. Common along the northern portion of the Lakes Impact Area and the Little Delta Training Area.	Ericaceous shrubs, Black spruce, and Sphagnum moss.
Riverine and	7	Common along the Delta and	Forest broadleaf, needleleaf, or

Wetland Type	Percent of Total Wetlands	Wetland Characterization and/or Location	Vegetation
Lacustrine Wetland Complexes		Little Delta rivers and Jarvis Creek, ponds, lakes, and their margins.	mixed shrubs, Willows and Alders, grasses, and sedges.

4.21.8.2 Environmental Consequences

No Action Alternative

Minor impacts to wetlands are anticipated under the No Action Alternative. Wetlands would be impacted through training, sedimentation, and construction to a minor extent each year.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Minor impacts are anticipated as a result of the implementation of Alternative 1. Deconstruction of facilities could result in sedimentation into adjacent wetlands. The impacts would likely be negligible or minor because the USAG FWA has SWMPs in place to mitigate the effects of sediment transport. No new range construction would occur. In addition, none of the current ranges would be expanded; therefore, no effects to wetlands are anticipated.

The number of required live-fire and maneuver training user days per year at USAG FWA would drop below current levels. Because the live-fire ranges were located to avoid significant wetland impacts, continued live-fire training is not anticipated to affect the function or presence of wetlands at USAG FWA. No new maneuver areas would be required and maneuver training would be conducted in the footprint of existing or previously approved ranges and trails at USAG FWA. Consequently, no change in impacts to wetlands from maneuver training is anticipated.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Overall, minor impacts are anticipated as a result of the implementation of Alternative 2.

Garrison Construction and Deconstruction. Impacts to USAG FWA would depend on siting of new facilities to accommodate growth. Construction that occurs north of the Tanana River could directly impact wetland areas or surface waters as a result of required fill activities to support facility construction. Also, the removal of upland vegetation as a result of clearing activities could result in adjacent wetland degradation due to increased sediment loading during rain events while construction is taking place. The effects from construction would be less harmful in winter due to the frozen nature of the wetlands, and the snowpack that protects vegetation. The impacts would likely be negligible or minor because the USAG FWA has SWMPs in place to mitigate the effects of sediment transport.

Training Infrastructure Construction. The USAG FWA takes precaution when siting a range to avoid impacts to wetlands where possible. In areas where filling of wetlands is unavoidable, these areas would likely be filled, or the vegetative cover would be altered. The USAG FWA implements BMPs and SOPs to minimize impacts on wetlands. If wetlands cannot be avoided, impacts can be minimized by following appropriate permit stipulations from the USACE which may require mitigation.

Heavy equipment and vehicles in the range area could remove vegetation and disturb soils, making them prone to erosion and creating runoff to nearby surface water and wetlands. Disturbed and compacted soils may also affect seedling establishment and near surface hydrology which may inhibit the re-establishment of plant communities. The impacts would likely

be negligible or minor because the USAG FWA has SWMPs in place to mitigate the effects of sediment transport into nearby wetlands.

Live-Fire Training. Impacts could occur to wetlands on the range area in the form of munitions constituent loading and sedimentation in wetlands located on USAG FWA firing ranges. These impacts are anticipated to be negligible or minor.

Maneuver Training. Combat Service Support maneuver scenarios would lead to minimal additional impacts to wetlands at USAG FWA. Increased use of un-improved trails would result in more sediment loading into adjacent wetlands and surface waters, though the overall increase in use would be anticipated to be minimal. No additional roads or trails would be constructed; therefore, only minor impacts to nearby wetlands from runoff are anticipated. Combat Support units could adversely affect wetlands through off-road maneuver of heavy vehicles, or increased sediment loading through surface excavation. Maneuver training from even light use can also impact the hydrology of an area by changing water flow and creating linear palustrine wetlands over several short years. Impacts to wetlands at USAG FWA are anticipated to be negligible or minor due to the use of avoidance practices, mitigation, and BMPs.

4.21.9 Water Resources

4.21.9.1 Affected Environment

Watershed. The Chena River originates in the non-glaciated Yukon-Tanana Uplands and passes through USAG FWA main post. The U.S. Geological Survey maintains a gauging station on the Chena River. The Chena River has been classified as Class A, Class B, and Class C. The pH varies seasonally from neutral to slightly below neutral. Groundwater flow varies greatly based on location. Groundwater quality is predominantly good on USAG FWA, although past military activities have degraded groundwater in some locations that are currently undergoing remediation (these areas have contributed to USAG FWA main post having been classified as a CERCLA site). Groundwater on USAG FWA main post is classified as an alluvial aquifer, fed primarily from the Tanana River. Groundwater there does contain high levels of metals, especially iron and arsenic. Elevated arsenic levels are prevalent in upland areas. These metals are naturally occurring and are not related to human-caused pollution.

TFTA is within the Tanana River watershed, and the river comprises the eastern and northern boundary of the training area; and the Wood River forms the training area's western boundary. TFTA contains a number of small lakes and ponds including the Blair Lakes covering approximately 2,718 acres. Much of this is considered wetlands. USAG FWA also employs the use of ice bridges over the Tanana and Delta rivers, Jarvis, McDonald, Dry, and Clear creeks, and Salchaket Slough, to provide access in and around TFTA and DTA during the winter months.

The Little Chena River flows northwest of YTA. All streams at the training area originate in the Yukon-Tanana Uplands, which are non-glaciated. Streams located in the northern portion of YTA drain into the Chena River; whereas streams originating in the southeastern portions of YTA drain into the Salcha River, a tributary of the Tanana River. YTA has many small lakes and wetlands that cover about 498 acres.

DTA is located within the Tanana Basin watershed, an Interior glacial waterway. There are four main rivers crossing DTA: from east to west they are: Jarvis Creek, Delta River, Delta Creek, and Little Delta River. The Delta River flows northward 80 miles from its headwaters to its confluence with the Tanana River and runs through the DTA for an estimated 30 miles. It drains an area approximately 1,650 square miles. Due to the combination of glacial and non-glacial inputs, the Delta River is difficult to classify as specifically glacial or non-glacial in nature. Jarvis

Creek originates at the terminus of Jarvis Glacier on the north side of the Alaska Range and flows northward for 40 miles through a narrow valley before passing through DTA East. The creek drains an estimated area of 248 square miles and receives glacial meltwater from Riley and Little Gold creeks. McCumber Creek and Morningstar Creek are non-glacial streams that enter Jarvis Creek from the Granite Mountains as it passes through DTA. Jarvis Creek flows across the same alluvial fan as the Delta River before converging with the river. Surface water quality for drinking water purposes on DTA meet the primary drinking water standards set by the Alaska Drinking Water Standards (18 AAC 80); however, aluminum, iron, and manganese concentrations were higher than the state's secondary standards. DTA water is of calcium carbonate type and is slightly basic. The pH measurements collected on DTA range from 7.9 to 8.4 standard units which are within the state's established limits of 6.5 to 8.5 standard units.

Water Supply. Water for USAG FWA is supplied to the installation through a series of subsurface wells and passed through the on-site water treatment plant. The water treatment plant consists of a small pressurized green sand filter plant connected to the water distribution system. During the summer the average flow is 2.7 mgd whereas in winter the average water flow is approximately 1.9 to 2.0 mgd. The flow of water through the treatment plant can be limited by quality or number of filters used by the plant to treat the water. The private utilities contractor is the owner and operator of the utility system at USAG FWA.

Water for DTA is provided by wells that yield as much as 1,500 gpm. Well testing indicates that permafrost generally does not extend into the saturated zone and does not act as a confining layer. The water table is located closer to the ground surface and has a seasonal fluctuation of 20 to 60 feet resulting from recharge and from precipitation.

Wastewater. USAG FWA has an on-site wastewater collection system that is discharged into the Golden Heart Utilities wastewater system through a central lift station. Fairbanks Sewer and Water is the parent company for Golden Heart Utilities WWTP, which provides service to more than 55,000 people and operates at a capacity of approximately 8.0 mgd (Utility Services of Alaska, Inc., 2012). The wastewater collection system at DTA is connected to a small lagoon treatment facility.

Stormwater. Soil resources management on USAG FWA is achieved through implementing soil loss and disturbance prevention activities and BMPs in agreement with industry standard installation stormwater pollution prevention techniques and actual restoration of disturbed areas. Disturbed areas are stabilized by both erosion control and stream bank stabilization activities, which control installation sources of dust, runoff, silt, and erosion debris in an effort to prevent damage to land, water, and air resources; equipment; and facilities (including those on adjacent properties). Relevant BMPs used at USAG FWA are detailed in the INRMP and in the ITAM Five Year Management Plan (USAG Alaska, 2005). There have been no Notices of Violation issued to USAG FWA for stormwater compliance violations in the last 5 years.

4.21.9.2 Environmental Consequences

No Action Alternative

Impacts to water resources would be minor. USAG FWA currently has plenty of potable and non-potable water to support its Soldiers, Families and missions.

Alternative 1: Force Reduction (up to 4,900 and Army Civilians)

Minor impacts are anticipated as a result of the implementation of Alternative 1. An increase in facilities demolition at USAG FWA would occur as a result of this alternative. USAG FWA would continue to implement its current BMPs, SPCC Plan, and SWPPP measures to address the ongoing effects of demolition and training on water resources. Negligible to minor impacts to

water resources at USAG FWA ranges are anticipated. In addition, the intensity and frequency of maneuver training at USAG FWA would drop below current levels and reduced effects to surface water from sedimentation resulting from maneuver training would be anticipated. A reduction in Soldiers and civilian employees would reduce water demand and also wastewater treatment requirements.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor impacts to water resources anticipated as a result of implementing Alternative 2. Construction and deconstruction activities could affect surface water by localized increases in erosion and runoff. Potential impacts would include increased overland flow and runoff and decreased percolation to groundwater due to surface compaction. Impacts from construction runoff are anticipated to be temporary. USAG FWA has a robust stormwater monitoring and compliance program, and is prepared to handle additional capacity. Any construction and deconstruction that disturbs more than 1 acre of land would require a SWPPP including use of BMPs to minimize pollution. Water demand would be anticipated to increase by up to 250,000 gpd on post. The current water supply could meet an increased number of Soldiers. Additionally, there is the available WWTP capacity to treat the estimated additional 275,000 gpd of wastewater that would be generated by Soldiers, civilians and their dependents.

Operation of construction vehicles could cause spills of POLs and other hazardous and toxic substances, which could result in indirect impacts to surface and/or groundwater if accidentally released into the environment. The Army has implemented BMPs, an SPCC Plan, and an SWPPP to address leaks or spills of hazardous materials.

The risk of wildfires is anticipated to remain at about the same level as under existing conditions or slightly higher due to the increase in Soldiers using these ranges. Wildfires can generate chemical contaminants, and loss of vegetation can increase the potential for soil erosion and sediment loading to streams resulting in impacts to water quality.

Additional traffic on the range road network and stream crossings during maneuver training may contribute to increased sedimentation and turbidity in waterbodies. Efforts may be considered to reinforce stream crossings and ice bridge approaches and monitor those areas for decreased water quality. Further, bivouac sites in the training area may also need to be monitored and maintained more closely to ensure against stormwater runoff that may stem from the effects of increased Soldier use throughout those areas.

Increased maneuver training at all sites would increase the use of fuels, solvents, and other hazardous and toxic substances, which might result in indirect impacts to surface and/or groundwater if accidentally released into the environment, however, implementing BMPs including the SPCC Plan would minimize potential impacts resulting from leaks or spills of hazardous materials. Impacts are anticipated to be negligible or minor.

4.21.10 Facilities

4.21.10.1 Affected Environment

Facilities and infrastructure at USAG FWA include Family housing; a road network; community support facilities such as a Child Development Center, police station, credit union, post office, one elementary school, and shops; Bassett Army Community Hospital; outdoor recreational facilities such as downhill skiing, a golf course, fishing, and a variety of water sports; and installation support facilities such as airspace and airfields, and training and range facilities. There are also 11 supply and storage locations found throughout the cantonment area including

two ammunition storage facilities, which are used to store inert supplies, equipment and/or material.

All utility services provided to USAG FWA were privatized in August of 2008. The power distribution system at USAG FWA is being systematically upgraded, and substantial portions of the power system were completely replaced in 2010. A new electrical substation was completed in 2009. Technology upgrades handle 50 percent more load than the currently existing power infrastructure.

As part of its facilities and infrastructure, USAG FWA has its own airfield (Ladd Army Airfield) and also uses nearby Eielson Air Force Base for large-scale deployments. Both military airfields can support any type of military aircraft. Ladd Army Airfield has one active runway, several ancillary taxiways, and hangars.

There are over 1,500 housing units on more than 400 acres of land, spread throughout six neighborhoods on the cantonment area. Due to age of housing, the installation has begun to revitalize Family housing through new construction to upgrade and/or replace substandard facilities through the Army Family Housing Privatization program. Housing requirements for accompanied Soldiers at USAG FWA was privatized in January of 2009, and is managed by the RCI program.

In 2005, the Army commissioned a HMA of assets on USAG FWA to assess the installation's ability to accommodate Soldiers (both with Families or unaccompanied) while meeting DoD's standards for affordability, location, quality, and bedroom requirements. The study reviewed the ability of housing supply in the private sector to absorb growth outside the installation. At the time, the study concluded that based on housing inventories there was an overall shortfall of housing units.

The quality and condition of Army ranges and training lands are managed and monitored as a part of the Army's SRP, which includes the RTLP and the ITAM program. Table 4.21-4 categorizes the types of training range infrastructure provided by USAG FWA and DTA. DTA has no Family housing facilities or community support or recreation facilities.

Table 4.21-4. Acres of U.S. Army Garrison Fort Wainwright and Training Land Facilities

Installation	Small Arms Ranges	Major Weapons Systems Ranges	Non Live-fire Ranges	Maneuver Training Areas	Total
USAG FWA					
Main Post	143	5,793	22	5,151	**11,109**
TFTA	0	58,828	0	595,370	**654,198**
YTA	2,386	25,854	5	229,035	**257,280**
DTA					
DTA	8,539	146,721	4	481,335	**636,599**
Gerstle River Training Area	0	0	0	20,589	**20,589**
Black Rapids Training Area	0	0	0	4,213	**4,213**

4.21.10.2 Environmental Consequences

No Action Alternative

Impacts to facilities would be negligible under the No Action Alternative. USAG FWA currently has adequate facilities available to support its Soldiers, Families and missions. The installation would continue to implement the Army's FRP at USAG FWA. Environmental analyses of the projects that result from these programs are conducted prior to implementation of facilities deconstruction.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Minor impacts are anticipated as a result of the implementation of Alternative 1. An increase in the FRP and facilities demolition at USAG FWA would occur as a result of Alternative 1. Older, less efficient facilities nearing the end of their life-cycle would be demolished when no longer needed to support Soldiers or their Families to save the Army on maintenance and energy requirements. Facility usage and availability for the remaining population would not be affected. Minor long-term effects are anticipated as a result of required building demolition, solid waste disposal, and site recapitalization, and the repurposing of existing facilities to accommodate different Army needs as part of force reduction. Alternative 1 would not result in the alteration or relocation of existing utility systems or expansion of existing installation facilities. A reduction in troop strength would impact the local housing community, on-post support services, the barracks program, and associated Army civilian staffing requirements. A troop reduction may also cause a reduction in the rental market available to the RCI program. As a result, the private partner associated with the RCI program could open the on-post military housing to the local population. This could indirectly impact the off-post rental markets. Additional new range construction would likely not occur given the reduction in troop strength as a result of this alternative. A reduction of Soldiers would lead to decreased training range use and a decrease in ammunition and generation of lead and other materials on ranges and within impact areas. Long-term impacts would include the decrease in use of maneuver areas during large brigade-sized and battalion-sized exercises.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would minor impacts to facilities under the No Action Alternative. Increased Soldier strength of 1,000 would be reflected through increased usage throughout the cantonment area.

Long-term effects are anticipated as a result of required construction to support Army growth from BCT restructuring. Construction at the main cantonment area may occur as infill construction between existing structures to accommodate this stationing scenario. These facilities would be tied in to existing utilities and water and wastewater infrastructure.

Family housing has recently been privatized. There will be a shortfall in housing units available to accommodate unaccompanied Soldiers and Soldiers with Families. Increases to housing wait list length and wait time would be projected to occur. New housing units may be constructed at the southeast or northern portion of the installation.

4.21.11 Socioeconomics

4.21.11.1 Affected Environment

USAG FWA is located within the Fairbanks North Star Borough, which according to the U.S. Census Bureau 2010 population estimate, has a total population of 97,581 The Fairbanks North Star Borough region includes the municipalities of Fairbanks and North Pole. According to the U.S. Census Bureau, the average labor force is estimated at 46,125 with a projected median

household income of $66,598 (U.S. Census Bureau, quickfacts.census.gov/qfd/states/02/02090.html). Fort Wainwright is located adjacent to Fairbanks. It is part of the Fairbanks, Alaska MSA. The ROI consists of Fairbanks North Star Borough in Alaska.

Fairbanks, with its diverse economy, is the regional service and supply center for Interior Alaska. The primary industrial sectors are government services (over one-third of total employment, including USAG FWA and Eielson Air Force Base), transportation, communication, manufacturing, financial, and regional medical services. Active Duty military compromised about 17 percent of the FNSB's workforce and Fairbanks' unemployment rate is lower than the statewide average. Population, housing, and economy in the FNSB are greatly influenced by USAG FWA and Eielson Air Force Base.

Fairbanks also serves as the major transportation hub for interior Alaska and for oil operations on the North Slope of Alaska. Primary passenger and cargo air travel service is offered by the Fairbanks International Airport Facility; and the Alaska Highway and Richardson Highway join to connect central Alaska with Anchorage and the continental U.S. There are no roads leading to western Alaska from Fairbanks.

DTA is located within the Southeast Fairbanks Census Region and includes the communities of Delta Junction and Tok, and the Alaska Native villages of Dot Lake, Healy Lake, Northway, Tanacross, and Tetlin. These areas are minimally impacted by military activities conducted at installations in central Alaska, and as such, will not be considered as part of the ROI associated with the Proposed Action. Very few support services are provided by Delta Junction area businesses.

Population and Demographics. The Fort Wainwright population is measured in three different ways. The daily working population is 7,430, and consists of full-time Soldiers and government civilians working on post. The population that lives on Fort Wainwright consists of 3,690 Soldiers and 4,049 dependents, for a total on-post resident population of 7,739. Finally, the portion of the ROI population related to Fort Wainwright is 9,425 and consists of Army Soldiers, and civilian employees, and their dependents living off post.

The ROI population is 97,581. The 2010 population increased 17.8 percent since 2000. The racial and ethnic composition of the ROI is presented in Table 4.21-5.

Table 4.21-5. Racial and Ethnic Composition

State and Region of Influence Counties	Caucasian (Percent)	African American (Percent)	Native American (Percent)	Hispanic (Percent)	Asian (Percent)	Multiracial (Percent)	Other (Percent)
Alaska	64	3	5	5	15	7	1
Fairbanks North Star Borough	74	4	7	6	3	6	0

Employment, Income, and Housing. Compared to 2000, the 2009 employment (private nonfarm) increased by 22.50 percent in Fairbanks North Star Borough. State employment increased by 21.20 percent. Total private nonfarm employment for Fairbanks North Star Borough in 2009 was 26,479 and total private nonfarm employment for the State of Alaska in 2009 was 252,882 (U.S. Census Bureau, quickfacts.census.gov/qfd/states/02/02090.html). The 2005-2009 median home value was $198,200 in Fairbanks North Star Borough, and the state median value was $221,300. The 2010 median household income was $66,598 in Fairbanks North Star Borough. State median income was $66,521 based on 2010 data. The percent of the population below the poverty level was 7.60 percent for Fairbanks North Borough, and the

state poverty level was 9.50 percent (U.S. Census Bureau, quickfacts.census.gov/qfd/states/02/02090.html).

In 2005, the Army commissioned a HMA of assets on and around USAG FWA to assess the installation's ability to accommodate Soldiers (both with Families or unaccompanied) while meeting DoD's standards for affordability, location, quality, and bedroom requirements. The study also reviewed the ability of housing supply in the private sector to absorb growth outside the installation. At the time, the study concluded that, based on housing inventories, there was an overall shortfall of housing units (by approximately 658 units). Conversely, the City of Fairbanks acknowledged that the HMA did not accurately portray housing construction because it relied on building permits required in the City of Fairbanks and North Pole, and did not take into account that building permits are not required in the majority of the Fairbanks North Star Borough. The U.S. Census Bureau recently documented that the Fairbanks North Star Borough has 41,783 housing units, instead of the 34,046 listed in the HMA, and an average of 780 new units per year since 2000 were constructed instead of the 331 average reported in the HMA.

There are 1,976 housing units on more than 400 acres of land, spread throughout six neighborhoods on the cantonment area. Fort Wainwright is able to meet approximately 50 percent of its Family housing requirements on post. Due to the age of housing, the installation has begun to revitalize Family housing through new construction to upgrade and/or replace substandard facilities through the Army Family Housing Privatization program. Housing requirements for accompanied Soldiers at USAG FWA was privatized in January of 2009, and is managed by the Residential Communities Initiative (RCI) program. An estimated 524 units would be constructed and an estimated 321 units would be revitalized under the RCI program. However, USAG FWA has enlisted personnel who require 3, 4, and 5 bedroom homes who are currently on the waitlist and not assigned to a home due to a delay in delivery of the 110 units at Taku Gardens (Tanana Trails).

Schools. Total enrollment in FNSB School District schools for the 2011-2012 school year was nearly 14,300 students, approximately a third of whom were in the elementary schools attended by children living on FWA (FNSB School District, 2012). Elementary school students living on FWA attend either Arctic Light Elementary School located on FWA, Ticasuk Brown Elementary School located in North Pole, or Ladd Elementary School located in Fairbanks. Children living on FWA attend Tanana Middle School and Lathrop High School, which are predominantly civilian schools. Other FNSB schools located near FWA, where military Families living off FWA are most likely to reside, include Denali, Hunter, Joy, Nordale (all elementary schools) and Barnette (kindergarten through 8th grade).

The schools in and around Fairbanks have a lower student-to-teacher ratio and a higher expenditure per pupil than the national average, and have a higher proportion of Native Alaskan students than both the state and national average. Funding for the school districts is largely provided by the State of Alaska and from local contributions (totaling approximately 30 percent of the operating budget in the municipal areas).

Public Services, Health and Safety.

- **Police Services.** The Fort Wainwright Police Department oversees police operations, patrols, gate security, training, traffic accident, and criminal investigations.
- **Fire and Emergency Services.** The Fort Wainwright Fire Department responds to emergencies involving structures, facilities, transportation equipment, hazardous materials, and natural and man-made disasters, and directs fire prevention activities; and conducts public education programs. The Fort Wainwright Fire and Emergency Services Division have mutual aid agreements with the Fairbanks North Star Borough

and the cities of Fairbanks and North Pole. City, borough, and state police departments provide law enforcement in the ROI.

- **Medical Facilities.** Health care services are provided by two hospitals and several clinics, and from Bassett Army Community Hospital on USAG FWA.

4.21.11.2 Environmental Consequences

No Action Alternative

There would be no change anticipated under the No Action Alternative. This alternative would be anticipated to provide a steady-state contribution of economic and social benefits and costs. No additional impacts to housing, public and social services, public schools, or public safety is anticipated.

Alternative 1: Force Reduction (up to 4,900[5] Soldiers and Army Civilians)

Economic Impacts. Alternative 1 would result in the loss of approximately 4,900 Soldiers and Army civilians, each with an average annual income of $58,768.[6] In addition, this alternative would affect an estimated 2,742 spouses and 4,718 dependent children, for a total estimated potential impact to 7,460 dependents. The total population of military employees and their dependents directly affected by Alternative 1 is projected to be 12,375 military employees and their dependents.

Based on the EIFS analysis, there would be significant impacts for employment and population. Significant impacts to income and sales in the ROI are not anticipated. The range of values that would represent a significant economic impact in accordance with the EIFS model is presented in Table 4.21-6. Table 4.21-7 presents the projected economic impacts to the region for Alternative 1 as assessed by the Army's EIFS model.

Table 4.21-6. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 1

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	40.5	40.42	23.35	7.01
Economic Contraction Significance Value	- 19.03	- 15.15	- 6.65	- 1.68
Forecast Value	- 13.36	- 10.45	- 18.80	- 12.68

Table 4.21-7. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	- $292,377,300	- $317,693,100	5,620 (Direct) - 755 (Indirect) - 6,375 (Total)	- 12,375
Percent	-13.36 (Annual Sales)	- 10.45	- 18.80	- 12.68

[5] Calculations used a number of 4,915 Soldiers and civilians for estimating socioeconomic impacts. This number was derived by assuming the loss of the 4,200 Soldiers of the SBCT, 30 percent of the installations remaining Active Duty Soldiers, and up to 15 percent of the civilian workforce. As discussed in Chapter 3, this number is rounded to the nearest hundred personnel when discussing impacts of Alternative 1.

[6] This amount is higher than the figure for other installations because it includes the substantial locality or variable housing allowances paid to military employees in the Fairbanks area. Use of the higher amount was necessary to put the possible changes in proper perspective with the ROI economy.

The total annual loss in direct and indirect sales in the ROI represents an estimated -13.36 percent reduction. Regional income would decrease by 10.45 percent. While approximately 4,900 Soldier and Army civilian positions would be lost within the ROI as a result of the implementation of Alternative 1, EIFS estimates another 705 military contract service jobs would be lost, and an additional 755 job losses would occur indirectly as a result of reduced demand for goods and services within the ROI. The total estimated reduction in employment within the ROI is projected to lead to a loss of 6,375 jobs, or a -18.80 percent change in regional non-farm employment. The total number of employed positions (non-farm) in the ROI is estimated to be approximately 33,900. A significant population reduction of 12.68 percent within the ROI is anticipated as a result of this alternative. Of the approximately 97,581 people (including those residing on Fort Wainwright) that live within the ROI, 12,375 Soldiers, Army civilians, and dependents would no longer reside in the area following the implementation of Alternative 1. This would lead to a decrease in demand for housing, and increased housing availability in the region. This could lead to a slight reduction in median home values. It should be noted that this estimate of population reduction includes civilian and military employees and their dependents. This number likely overstates potential population impacts, as some of the people no longer employed by the military would continue to work and reside in the ROI, working in other economic sectors; however, this would in part be counterbalanced by the fact that some of the indirect impacts would include the relocation of local service providers and businesses to areas outside the ROI.

Table 4.21-8 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 1.

Table 4.21-8. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 1

Region of Influence Impact	Sales Volume	Income	Employment
Total	- $156,488,091 (Local) - $251,217,265 (State)	- $222,498,460	- 5,235 (Direct) - 373 (Indirect) - 5,608 (Total)
Percent	- 7.13 (Total Regional)	- 7.32	- 16.54

The total annual loss in volume from direct and indirect sales in the ROI represents an estimated -7.13 percent change in total regional sales volume according to the RECONS model, an impact that is approximately 6.23 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would decrease by approximately $17.6 million as a result of the loss in revenue from sales reductions, which would only be $80,000 more in lost state sales tax revenue that projected by the EIFS model. Regional income is projected by RECONS to decrease by 7.32 percent, less than the 10.45 percent reduction projected by EIFS. While approximately 4,900 Soldier and Army civilian positions would be lost within the ROI, RECONS estimates another 320 military contract and service jobs would be lost, and an additional 373 job losses would occur indirectly as a result of reduced demand for goods and services in the ROI. The total estimated reduction in demand for goods and services within the ROI is projected to lead to a loss of 5,608 jobs, or a -16.54 percent change in regional employment, which would be 2.26 percentage points lower than the reduction projected by the EIFS model.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 1 would lead to an overall reduction in economic activity in the

ROI of about the same order of magnitude, though the models do predictions do vary considerably for sales volume impacts.

Housing. A reduction in troop strength would impact the local housing community, on-post support services, the barracks program, and associated Army civilian staffing requirements. A troop reduction may also cause a reduction in the rental market available to the RCI program. As a result, the private partner associated with the RCI program could open the on-post military housing to the local population. This would indirectly impact the off-post rental markets.

Schools. The effect on the local school system is not certain. The local school system can also expect some impact due to the loss of revenue via the Department of Education (Federal School Impact Aid program). The Fairbanks North Star Borough School District received approximately $14,428,640 in Federal School Impact Aid for the 2010-2011 school year. That includes $13,463,100 in basic Section 8003(b) allocations, $377,210 in additional funding for special needs children, and $588,330 in Section 7703(a) DoD funds. However, because the State of Alaska is allowed to take Federal Impact Aid funding into account when distributing public education foundation dollars, the economic impact to the FNSB School District is somewhat different. Because of the level of Federal Impact Aid funding received, the state reduced foundation funding to the FNSB school district by $6,012,400. Not all Federal Impact Aid funding is eligible to be offset by the state, but state foundation funding is generally reduced by 56 percent for every Section 8003(b) dollar received. Based on current student counts, about 67 percent or $9.6 million of Federal Impact Aid funding, is attributable to Soldier dependents at Fort Wainwright.

Public Services, Health and Safety. As a result of the implementation of Alternative 1, resident and daytime population levels on Fort Wainwright would decrease and could potentially reduce demand on law enforcement, fire and emergency service providers, and on medical care providers on and off post. Active Duty military, remaining permanent party Soldiers, retirees, and their dependents, would continue to require these services. Fort Wainwright anticipates less than significant impacts to public health and safety under this alternative.

Environmental Justice. As a result of the implementation of Alternative 1, Fort Wainwright does not anticipate that a disproportionate adverse impact to minorities, economically disadvantaged populations or children would occur in the ROI. Fort Wainwright anticipates that job loss would be felt across economic sectors and at all income levels and spread geographically throughout the ROI. The proposed force reduction in military authorizations on Fort Wainwright would not have disproportionate or adverse health effects on low-income or minority populations in the ROI. The racial and ethnic composition of the ROI differs from that of the state as a whole. There are fewer Alaska Native and Asian people in the ROI, but a larger African American and Hispanic population in the ROI. At the state-wide level, adverse impacts in the ROI represent a minor disproportionate adverse impact to the African American and Hispanic population.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Economic Impacts. Alternative 2 would result in the increase of up to 1,000 Soldiers, each with an average annual income of $58,768. In addition, this alternative would affect an estimated 558 spouses and 960 dependent children, for a total estimated potential impact to 1,518 dependents. The total population of military employees and their dependents directly affected by Alternative 2 would be 2,518 military employees and their dependents.

Based on the EIFS analysis, there would be no significant impacts for sales volume, income, employment, or population. The range of values that represents a significant economic impact in

accordance with the EIFS model is presented in Table 4.21-9. Table 4.21-10 presents the projected economic impacts to the region for Alternative 2 as assessed by the Army's EIFS model.

Table 4.21-9. Economic Impact Forecast System and Rational Threshold Value Summary of Implementation of Alternative 2

Region of Influence Economic Impact Significance Thresholds	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Economic Growth Significance Value	40.5	40.42	23.35	7.01
Economic Contraction Significance Value	-19.03	-15.15	-6.65	-1.68
Forecast Value	2.72	2.12	3.82	2.58

Table 4.21-10. Economic Impact Forecast System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Region of Influence Impact	Sales Volume	Income	Employment	Population
Total	$59,486,730	$64,637,460	1,144 (Direct) 154 (Indirect) 1,297 (Total)	2,518
Percent	2.72	2.12	3.82	2.58

The total annual gain in volume of direct and indirect sales in the ROI would represent an estimated 2.72 percent change from the total current sales volume of $2.18 billion within the ROI. Regional income would increase by 2.12 percent. While 1,000 Soldiers would be gained within the ROI, EIFS estimates another 144 direct military contract service jobs would be gained, and an additional 154 jobs would be created indirectly from an increase in demand for goods and services in the ROI. The total estimated increase in employment within the ROI is projected to lead to a gain of 1,297 jobs, or a 3.82 percent change in regional employment. The total number of employed non-farm positions in the ROI is estimated to be 33,909. A population increase of 2.58 percent within the ROI is anticipated as a result of this alternative. Of the estimated 97,581 people (including those residing on Fort Wainwright) that live within the ROI, 2,518 military employees and their dependents would be begin to reside in the area following the implementation of Alternative 2. This would lead to an increase in demand for housing, and decreased housing availability in the region. This could lead to a slight increase in median home values.

Table 4.21-11 shows the total projected economic impacts, based on the RECONS model, that would occur as a result of the implementation of Alternative 2.

Table 4.21-11. Regional Economic System: Summary of Projected Economic Impacts of Implementation of Alternative 2

Regional of Influence Impact	Sales Volume	Income	Employment
Total	$31,838,887 (Local) $51,112,376 (Local)	$45,269,280	1,065 (Direct) 76 (Indirect) 1,141 (Total)
Percent	1.40 (Total Regional)	1.5	3.36

The total annual gain from direct and indirect sales increases in the region represents an estimated 1.40 percent change in total regional sales volume according to the RECONS model, an impact that is 1.32 percentage points less than projected by EIFS; however, it is estimated that gross economic impacts at the state level would be greater. Extrapolating from sales volume numbers presented in the RECONS model, it is anticipated that state tax revenues would increase by approximately $3.06 million as a result of the gain in revenue from sales reductions, which would be $480,000 less in additional state sales tax revenue than projected by the EIFS model. Regional income is projected by RECONS to increase by 1.5 percent, slightly less than the 2.12 percent projected under EIFS. While 1,000 Soldiers would be gained within the ROI, RECONS estimates another 65 military contract and service jobs would be gained, and an additional 76 jobs would be created indirectly as a result of indirect increases in demand for goods and services in the ROI as a result of force increase. The total estimated increase in demand for goods and services within the ROI is projected to lead to a gain of 1,141 jobs, or a 3.36 percent change in regional employment, which would be 0.46 percentage points less than projected by the EIFS model.

When assessing the results together, both models indicate that the economic impacts of the implementation of Alternative 2 would lead to a net increase of economic activity within the ROI of roughly the same magnitude.

Housing. According to the 2005 housing analysis conducted by USAG FWA, there would be a shortfall in available vacant housing space on the installation to accommodate the additional Soldiers. There would be an abundance of buildable space available within the Fairbanks metropolitan area to absorb growth.

USAG FWA currently has enlisted personnel who require 3, 4, and 5 bedroom homes who are currently on the waitlist and not assigned to a home. Should no new homes become available and personnel continued to be assigned, the delay in delivery of the 110 units at Taku Gardens (Tanana Trails) will prolong waiting times, and require Families to acquire off-post housing that is affordable and adequate. Additionally, with the lack of available larger homes, Soldiers and their Families that would normally occupy those homes are finding the need to retain smaller homes on post. Thus, this affects Soldiers and their Families who are eligible for smaller homes on post, in that they must then attempt obtain adequate, affordable housing off post.

Schools. The increase in unit strength would also have an increase in school enrollment. As indicated above, the Fairbanks North Star Borough has a lower student-to-teacher ratio than the national average. The addition of a 1,000 Soldiers may add approximately 225 school-aged children to the school system, spread out from grades K-12. It is anticipated that the school system would be able to absorb this level of student growth without the need for new or expanded facilities.

Public Services, Health and Safety. As a result of the implementation of Alternative 2 resident and daytime population levels on Fort Wainwright would increase and could potentially increase demand on law enforcement, fire and emergency service providers, and on medical care providers on and off post. Active Duty military, civilians, retirees, and their dependents, would continue to demand these services. Fort Wainwright anticipates less than significant impacts to public health and safety as a result Alternative 2.

Environmental Justice. As a result of the implementation of Alternative 2, Fort Wainwright does not anticipate that a disproportionate adverse impact to minorities, economically disadvantaged populations, or children would occur in the ROI. The proposed force increase in military authorizations on Fort Wainwright would not have disproportionate or adverse health effects on low-income or minority populations in the ROI.

4.21.12 Energy Demand and Generation

4.21.12.1 Affected Environment

All Fort Wainwright utilities were conveyed to a private utilities contractor on 15 August 2008. Pursuant to 10 USC 2668, the private utilities contractor was granted an easement that includes non-exclusive access to utility corridors for the purpose of operating, maintaining and upgrading these utilities.

During the first 5 years of operation, all electric facilities at USAG FWA are being completely rebuilt. A new substation was constructed in June of 2009. This station has 50 percent excess capacity (or more) and can be expanded by simply adding an additional transformer. All electrical circuits and supply systems are being constructed with 50 percent extra capacity and loop feed capabilities to accommodate future growth.

USAG FWA has a central coal-fired power plant that produces electricity and steam heat for the installation and is responsible for approximately 95 percent or more of the energy capability throughout USAG FWA. The power plant also provides heat in the form of steam to a majority of structures throughout the cantonment area (many of the buildings there are also heated by individual boilers). The private utilities contractor would install approximately 13 to 18 MW of additional turbine capacity to utilize extra steam. This technology upgrade would make USAG FWA completely energy self-sufficient within the next 2 to 3 years and would allow excess energy to be sent to Fort Greely or to other installations. Power needs at DTA are currently supplied via a combination of the Golden Valley Electric Association, the power plant at Fort Greely, and the power plant at USAG FWA(2004 *USARAK Transformation EIS* (USARAK, 2004)).

4.21.12.2 Environmental Consequences

No Action Alternative

The No Action Alternative would result in negligible effects to existing energy demand and utilization by USAG FWA. USAG FWA would continue to look for ways to reduce energy use and increase energy efficiency as a result of this alternative.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Long-term beneficial impacts to the power generation system are anticipated resulting from Alternative 1. Decreases associated with demand on the power plant, energy distribution lines, and infrastructure would result. The overall influence of the force reduction is anticipated to result in a decrease of regional power demand. Less energy resources, including coal and fuel, would be consumed.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

USAG FWA would experience minor impacts from the additional Soldiers and Family members. The installation's current energy infrastructure would be able to accommodate the addition of 1,000 Soldiers and their Family members. An increase in population associated with a stationing scenario would increase demand on the power plant, energy distribution lines, and infrastructure. Given that privatization resulted in technology upgrades and increased efficiency in power and heat distribution; the overall influence that Army growth is anticipated to have to regional power demand and generation capability is anticipated to be a minor impact. There may be additional long-term energy demand in training areas, but demand is anticipated to be slight and inconsequential compared to system capacity.

4.21.13 Land Use Conflicts and Compatibility

4.21.13.1 Affected Environment

Existing land use boundaries are defined for major land use categories identified in the USACE Master Planning Instruction. These have been established as the framework for future land use decisions. Each land use category is evaluated against established criteria to determine compatibilities, constraints, and opportunities. Land use categories are assumed to be compatible with adjacent land uses.

USAG FWA consists of over 1 million acres of land divided into eight land use planning categories; these include transportation, housing, community, installation support, range and training lands, maintenance, outdoor recreation, and miscellaneous.

DTA has 636,599 acres of land which is dedicated to range and training use. The types of military activities covered by this land use include the research, test, and evaluation of and training of military munitions items, explosives, other types of ordnance, and weapons systems.

The public is always allowed access on DTA except for permanently closed areas such as the impact areas and the SAC. In addition, access is closed in specific training areas during military training exercises (only areas being used for training are closed). Sometimes access is restricted during range construction as it currently is for the Battle Area Complex and CACTF construction.

Other Projects and Right-of-ways. The Northern Intertie Project involves the installation of a 230 kV transmission line near the northeast boundary of TFTA. The transmission line has a ROW of 150 to 300 feet wide and 90 to 170 miles long. The Trans-Alaska Pipeline System ROW extends through YTA. Its width is 50 feet plus the ground area occupied by the pipeline. The 50 foot wide Alaska Natural Gas Transportation ROW lies adjacent to the pipeline. The Army and BLM approved an additional ROW for the Trans-Alaska Gas System which will run parallel to the existing pipelines.

Environmental remediation projects under CERCLA, especially in the cantonment area, impact the construction in support of facilities, recreation and roads.

4.21.13.2 Environmental Consequences

No Action Alternative

Under No Action Alternative, no changes to land use conditions would occur. Continuing minor impacts to land use would be anticipated.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Minor impacts to land use would be anticipated to occur as a result of the implementation of Alternative 1 at USAG FWA. A reduction in training land use would occur that roughly correlates with the number of Soldiers inactivated or realigned as a result of this alternative in comparison to those remaining at USAG FWA. The loss of up to 4,900 Soldiers and Army civilian employees would decrease use of existing training land and training facilities. Alternative 1 would involve the demolition of some facilities and construction of new facilities within the existing cantonment area. Minor land use impacts from construction and deconstruction at USAG FWA are anticipated. No new range construction would occur as a result of this alternative. In addition, none of the current ranges would be expanded; therefore, no significant effects to land uses are anticipated.

Implementation of the USAG FWA institutional programs, associated land management practices and coordination among Army, federal, state, and local land managers would

continue; however, a reduction in live-fire and maneuver training may increase opportunities for recreational, hunting, and subsistence activities due to more training areas being opened.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor impacts from land use conflicts and compatibility anticipated as a result of the implementation of Alternative 1. Up to 1,000 additional Soldiers would require the additional use of training areas and qualification ranges. Construction may impact structures that contribute to the NHL or Historic District. Any construction occurring at the borders of the designated NHL or Historic District may have direct or indirect effects and would require additional consultation with the SHPO. There may also be short-term impacts to land use compatibility from construction noise and from activities that create fugitive dust.

No changes to land use designations within existing ranges or impact areas are anticipated. Increased noise, dust, or other indirect effects associated with these stationing alternatives are not anticipated to affect off-post land uses. Less training land availability for recreational activities such as hunting could occur due to an increase in training activities.

Increased Soldier stationing would also drive increases of summertime maneuver training requirements, as fewer areas would be available for training due to saturated soils that wouldn't support vehicular training. More units would compete for training on available training areas during the summer months. During winter, access to maneuver areas would improve because soil conditions can support training over a much larger land area. Impacts associated with public access closures are anticipated to be minor because alternate areas at these training areas would still be available for recreational and subsistence activities.

4.21.14 Hazardous Materials and Hazardous Waste

4.21.14.1 Affected Environment

USAG FWA is registered with EPA as a Large Quantity Generator of hazardous waste in accordance with the RCRA. There is no treatment facility on-site and all hazardous waste generated at the installation is stored and removed from the installation within 90 days. Hazardous waste at USAG FWA is primarily generated from vehicle maintenance and facilities operations. Hazardous materials include petroleum-contaminated absorbent pads, batteries, light ballasts, mercury containing bulbs, oils and fuels, compressed gas, LBPs, paint thinners and solvents, pesticides, solvents and degreasers, and non-recyclable transmission fluid. Proper management and disposal of hazardous materials and waste is completed in accordance with USAG Alaska Pamphlet 200-1 Hazardous Materials and Regulated Waste Management (USAG Alaska, 2000).

USAG FWA was listed on the EPA National Priorities List on 30 August 1990, under CERCLA of 1980 (Superfund). In 1992, the Army, EPA, and Alaska Department of Environmental Conservation signed a Federal Facility Agreement requiring a thorough investigation of suspected historical hazardous waste source areas and appropriate remediation actions required to protect public health. The installation is in the process of cleanup activities under its IRP, and the discovery of any further contamination as outlined in the Federal Facilities Agreement would require appropriate regulatory coordination and compliance. As part of the investigations, the Army and EPA identified five separate areas requiring remediation; these are discussed in greater detail in Section 3.8 of the *Final EA for Construction and Operation of a Railhead Facility and Truck Loading Complex* (USAG Alaska, 2007).

Most activities that use or generate hazardous materials are conducted in the cantonment area; however, hazardous material is also generated from vehicle maneuvers (spills) and live-fire

activities that produce lead, UXO, and explosive residues. Hazardous wastes are also generated during field training exercises (from vehicle maintenance, accidental spills, etc).

Ammunition, Live-fire, and Unexploded Ordnance. TFTA, YTA, and DTA impact areas include a 2-mile buffer zone. Impact areas and buffer zones are off limits to unauthorized personnel. In addition, all sites are clearly marked with warning signs for the potential risk of UXO.

Petroleum, Oil, and Lubricants. USAG FWA has 13 ASTs with capacities ranging from 300 to 13,000 gallons containing fuel and heating oil. Most of these tanks are double-walled and are inspected annually. Three tanks are single walled but are contained within secondary earthen dikes. These tanks are inspected daily. Because the installation's storage tanks do not exceed 420,000 gallons, an Oil Discharge Prevention and Contingency Plan is not required. The installation has 59 USTs, and these tanks are equipped with electronic monitoring devices that are designed to detect leaks and overfill. USTs are double-walled and are monitored monthly.

Installation Restoration Program. USAG FWA has a large amount of land that is devoted to large scale remediation projects. Due to past contamination on main post, USAG FWA has been classified as a CERCLA site.

Army-related and industrial activity on main post has caused groundwater pollution associated with underground tanks, chemical storage facilities and chemical dump sites. These areas are monitored intensively. Army restoration projects have mitigated damage to groundwater quality, and practices leading to contamination have been discontinued. Of the 127 sites investigated at USAG FWA for cleanup, 38 were identified as Superfund OUs (28 have been closed and no further remediation is planned; 10 sites are still active). Of the remaining 89 sites, 70 have been remediated. Long-term monitoring is being conducted at 18 sites, and 1 site is currently being investigated (USARAK, 2004).

Lead. Many of the Family housing units on the installation were surveyed for LBP. The results of the surveys concluded that most Housing facilities do contain lead, most commonly found in deteriorating paint and on exterior surfaces.

Asbestos. Asbestos-containing materials may include floor tile, linoleum, wallboard, pipe insulation, and tarpaper; all materials that may be found in Family housing units and facilities alike. Most of the buildings on USAG FWA contain some asbestos. While few surveys have been conducted on the installation, surveys are conducted prior to any renovation or demolition work. Asbestos, during renovation or demolition, is removed and disposed of in asbestos cells at local landfills. The installation's neighborhood revitalization programs have resulted in the removal of asbestos from most of the housing units.

Pesticides and Herbicides. These materials are handled in accordance with all applicable regulations including the Integrated Pest Management Plan for USAG FWA. These materials may be used to control rodents and insects at facilities around the main cantonment area, and may be applied at ranges and training areas to control pests and invasive weed species.

Radon*:* Radon surveys were conducted on the installation from 1989 to 1990. Survey results indicated that radon was at acceptable levels.

Hazardous Wastes and Biomedical Waste. Bassett Army Community Hospital ensures proper disposal of biomedical and other types of hazardous human wastes. Two other facilities located at the north and south ends of the installation also store medical and dental wastes.

Non-Hazardous Wastes. FWA disposes of its non-hazardous solid waste at its installation landfill. Though current plans call for the closure of the FWA landfill some time during the next

few years, there exists ample capacity and willingness at the Fairbanks North Star Borough landfill to accept all waste, included any projected increases, from FWA.

Recycling. FWA also has a robust recycling program which includes waste stream materials such as light bulbs; glycols; batteries, POLs; and brass from shell casings.

4.21.14.2 Environmental Consequences

No Action Alternative

During the day-to-day operations at USAG FWA, the installation and its contractors would adhere to existing SOPs and USAG Alaska 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.

Negligible effects are anticipated under the No Action Alternative. There would be no change in USAG FWA's management of hazardous materials, toxic substances, hazardous waste, or contaminated sites. USAG FWA would continue to manage existing sources of hazardous waste in accordance with the HWMP.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Negligible impacts are anticipated as a result of the implementation of Alternative 1. In the short term, there would be an increase in the demolition of outdated and no longer needed facilities. This would increase the volume of solid waste generated. In addition, an increase in asbestos and LBP disposal is anticipated until facility reduction is completed as a result of this alternative. Construction workers and Army personnel would take measures to dispose materials in accordance with regulatory requirements installation management plans. With the implementation of the USAG FWA institutional programs, BMPs and SOPs, impacts are anticipated to be negligible or minor.

The number of required live-fire user days per year at USAG FWA would drop below current levels and no new types of weapons are anticipated to be introduced to training areas; therefore, a reduction in the amounts of ammunition that would be used or in the generation of UXO and lead contamination on training ranges is anticipated. The intensity and frequency of maneuver training at USAG FWA would drop below current levels. There would be less risk of spills of hazardous materials in the training areas and an associated reduction of long-term impacts, though overall, impacts would remain negligible.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Although it is very difficult to forecast the exact increase in hazardous waste that would occur due to Alternative 2, it would be projected to be relatively small and easily managed by existing disposal processes. Hazardous waste is removed from FWA and their associated training lands by utilizing the Defense Logistics Agency's Defense Reutilization and Marketing Service. In discharging its responsibilities, Defense Reutilization and Marketing Service will continue to contract with appropriate hazardous waste disposal contractors, a process that guarantees that there will be suitable recipients for any and all hazardous waste generated at FWA and DTA. Moreover, the amount of hazardous waste to be generated due to this alternative, though very difficult to estimate, is anticipated to be no more than 3-5 percent of current amounts at USAF FWA.

Overall, existing practices are expected to improve health and safety impacts from the use, storage, or disposal of hazardous materials. Negligible impacts from hazardous materials and waste would be anticipated with an increased Soldier strength of up to 1,000 Soldiers and their

Families. Due to the continued efforts of USAG FWA to modernize equipment that would effectively reduce waste, as well as the minimal increases posed by Alternative 2, no significant increases in the use of hazardous materials or generation of hazardous wastes would occur. The storage, use, handling, and disposal of hazardous materials, toxic substances, and hazardous wastes would not increase the risk to human health due to direct exposure, would not increase the risk of environmental contamination, and would not violate applicable federal, state, local, or DoD regulations. Existing management procedures, regulations, plans, and permits would be used to minimize risk. Therefore, impacts regarding hazardous materials and wastes for FWA and DTA are considered to be negligible.

Construction and demolition of structures within the cantonment area would generate hazardous waste due to the presence of asbestos and LBP in some of the older existing structures. The installation would ensure that any removal and disposal of these materials would be in accordance with established federal, Army, and USAG FWA regulations and policy for handling hazardous materials and waste. New construction would involve the testing, recordation, and mitigation (if necessary) for radon.

The increase in Soldiers would result in the generation of biomedical wastes from dental and medical facilities on post. These wastes would be processed in accordance with current SOPs and regulations. Because the installation is already considered a Large Quantity Generator no additional permitting or significant actions are likely to be required.

Alternative 2 would increase the frequency of Soldier live-fire training, thus increasing the amount of lead bullets and other munitions expended in the range area. Live-fire small arms ranges would retain their berms to stop projectiles fired at the ranges. Although more lead would be fired into impact berms, the installation has mitigation measures in place to ensure berms are well maintained and re-graded as needed to prevent erosion.

No new weapon types would be introduced to USAG FWA training areas. Handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations.

Transportation of personnel and use of flammable or combustible materials, such as fuel or ordnance (i.e., weaponry or equipment), would increase the potential for spills or releases of hazardous materials to the environment. BMPs would continue to be exercised throughout the garrison. USAG FWA's existing programs, management plans, and regulations that govern handling, use, storage, and disposal of hazardous and non-hazardous materials would remain in place. All spills should be cleaned immediately in accordance with USAG FWA Pamphlet 200-1.

4.21.15 Traffic and Transportation

4.21.15.1 Affected Environment

USAG FWA has two primary roads that lead onto the installation, with four main roads and numerous secondary roads used for transportation on the installation. The transportation services available to DTA (and Delta Junction) include the Richardson and Alaska highways. The highways both have two lanes and undergo year-round maintenance. The state has recently (in 2007) constructed several passing lanes on the Richardson Highway between Fairbanks and Delta Junction specifically to help alleviate traffic issues with convoys running between USAG FWA and DTA.

Military convoy traffic can be a nuisance concern on state highways and may occasionally be perceived as severe enough to be a potential human health and safety risk. Military convoys are most common between USAG FWA main post and YTA or DTA. Army convoys are subject

to a permitting process in conjunction with the Alaska Department of Transportation. Large convoys are broken up into smaller components called serials, consisting of no more than 20 vehicles with 20 to 30 minute gaps between departures to reduce traffic impacts. Highway speeds cannot exceed 40 mph.

The Alaska Railroad provides rail service to USAG FWA. The main line passes through the central cantonment area, with spur tracks serving the central heating and power plant and warehouse circle. DTA has no rail service.

Aviation is an essential component of transportation in the USAG FWA region. The civilian community utilizes Fairbanks International Airport. USAG FWA has its own airfield and also uses nearby Eielson Air Force Base for large-scale deployments. Both military air fields can support any type of military aircraft. Ladd Army Airfield has one active runway, several ancillary taxiways, and hangars. The runway is classified as Class C Airspace. Allen Army Airfield is located at Fort Greely, adjacent to DTA, and is also classified as Class C Airspace.

4.21.15.2 Environmental Consequences

No Action Alternative

Minor impacts are anticipated under the No Action Alternative. Surveys and studies conducted on the existing transportation system determined that it is sufficient to support the current traffic load.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Beneficial long-term effects would be anticipated from the decrease in military fleet vehicles and POVs, likely alleviating the traffic flow issues at the Main Gate entrance to the installation. With the implementation of Alternative 1, the Soldier population would decrease and there would be less traffic competing with seasonal (summertime and spring) traffic conditions associated with tourism. A reduction in military use of range roads or trails within USAG FWA training areas would occur. In addition, impacts to local highways associated with military convoys would also be reduced. Potential conflicts between civilian use and military use of local roadways would be reduced proportionately with the reduction in overall military population at USAG FWA.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

There would be minor, short- and long-term impacts on traffic and transportation systems. Construction equipment and worker vehicles would have short-term impacts at the Main Gate and at the roads around any designated construction sites. It is likely that impacts to traffic patterns on post would be negligible to minor resulting from a 1,000 Soldier stationing alternative.

Long-term effects would be anticipated from the increase in military fleet vehicles and POVs, potentially causing minor flow issues at the Main Gate entrance to the installation. With Alternative 2, the Soldier population would increase by 1,000. The added traffic from these units would compete with seasonal (summertime and spring) traffic conditions associated with tourism; however, the addition of passing lanes on the Richardson Highway would help to alleviate congestion as a result of current seasonal traffic conditions. Also, traffic utilizing the various main post access gates during morning and evening times may cause minor congestion for short periods of time.

Short-term effects from construction equipment in the Small Arms Range Complex area are anticipated. The action would temporarily increase traffic to construction sites, affecting the flow within the Range Complex and potentially the Richardson Highway and local communities

surrounding the installation. It is likely that impacts to traffic patterns would be negligible to minor as a result of the implementation of Alternative 2. Impacts would be anticipated on local highways from military convoys. The garrison enforces a convoy procedure permitting groups of vehicles (or serials). Following this procedure reduces the impact to traffic on these major highways. Also, with the addition of new passing lanes, overall impacts would be negligible to minor.

4.21.16 Cumulative Effects

Region of Influence

The ROI for this cumulative impact analysis of Army 2020 realignment at USAG FWA encompasses the cites of Fairbanks, North Pole and Delta Junction, Alaska, as well as the Fairbanks North Star Borough and the Unincorporated Borough of Delta Junction, unless otherwise stated in the analysis below. Fairbanks is the largest city within the ROI. Approximately 100 miles separate Delta Junction, and Fairbanks and North Pole. USAG FWA has long been a key component of the economy of the interior Alaskan region, employing several thousand Soldiers and civilian employees within the ROI. USAG FWA has been in operation supporting the DoD since 1939.

There are numerous planned or proposed actions within the ROI that have the potential to cumulatively add impacts to Army 2020 alternatives. These actions are either in progress or reasonably could be initiated within the next 5 years. A number of the Army's proposed projects have been previously identified in the installation's Real Property Master Planning Board and are programmed for future execution. A list of projects below presents some of the projects which may add to the cumulative impacts of the implementation of Army 2020 realignment alternatives.

U.S. Army Garrison Fort Wainwright Projects (Past, Present, and Reasonably Foreseeable)

- Stationing of military training support equipment to include vehicles, aircraft and other materiel.
- Programmed FY 2012 to FY 2018 MILCON at USAG FWA. Specific SBCT-related projects include an Unaccompanied Personnel Housing 294-Soldier barracks and at 4-plex Company Operations Facility, Battalion Operations Facility Headquarters with classrooms, organizational storage and parking. These projects are currently identified for FY 2013 and FY 2016, respectively, but could be reprioritized to FY 2018.
- Determination of future disposition of two historic hangars on Ladd Air Airfield.
- Updates to existing INRMPs and ICRMPs.

Other Agency (DoD and non-DoD) and Public/Private Actions (Past Present and Reasonably Foreseeable)

- Current resource management programs, land use activities and development projects that are being implemented by other governmental agencies and the private sector to include training and testing activities conducted at USAG FWA and associated training lands by the U.S. Air Force and Cold Regions Test Center.
- Continued participation with the Fairbanks North Star Borough and Eielson Air Force Base in support of the JLUS for Fairbanks and North Pole.
- U.S. Air Force stationing actions occurring at Eielson Air Force Base, to include potential realignment of F-16 aircraft from Eielson Air Force Base to Elmendorf Air Force Base.
- Augmentation of airspace designations by U.S. Air Force.

- Development of the Joint Pacific Alaska Range Complex, a Proposed Action to enhance joint training opportunities for the Army and Air Force in Alaska by incorporating existing land and airspace assets into a holistic training venue.
- Evaluation, consolidation and enhancement of testing operations conducted by Cold Regions Test Center at DTA.
- Updates to land management plan applicable to surrounding State of Alaska lands.
- Updates to land management plans applicable to surrounding BLM lands.

USAG FWA anticipates a range of cumulative effects resulting from the implementation of the Proposed Action and alternatives. Cumulative impacts for each alternative are as follows:

No Action Alternative

Beneficial through significant but mitigable adverse cumulative impacts would be anticipated from implementing the No Action Alternative. Under the No Action Alternative, no changes in military authorizations, or local environmental conditions would be anticipated. Installation facility shortages and excesses would remain at their currently planned levels without additional stationing or force reductions. The Army would continue to implement some facilities reductions of outdated/unused facilities. Under the No Action Alternative, cumulative impacts to the following VECs would have no impact, or have a minor impact only and are not carried forward for detailed discussion in this section. These VECs are: air quality, airspace, noise, soil erosion, biological resources, wetlands, water resources, facilities, socioeconomics, energy demand and generation, land use conflict and compatibility, hazardous materials and hazardous waste, and traffic and transportation. Cumulative impacts under the No Action Alternative that would be more than minor are cultural resources.

Past, present, and reasonably foreseeable demolitions and modifications to facilities that are eligible for listing in the NRHP and are a part of the Ladd Field NHL could result in adverse effects to both the individual buildings and the NHL as a whole. Additional NEPA analysis and compliance with Section 106 and Section 110 of the NHPA would be required if a specific undertaking associated with facility demolition in support of Army 2020 reductions is proposed for USAG FWA. Conversely, modifications to cultural resource management associated with current updates to USAG FWA's ICRMP could reduce adverse impacts through actions that avoid, minimize or mitigate to less than significant impacts through the NHPA Section 106 process.

Alternative 1: Force Reduction (up to 4,900 Soldiers and Army Civilians)

Cumulative impacts as a result of the implementation of Alternative 1 range from beneficial impacts to significant socioeconomic impacts. As a result of Alternative 1, the Army anticipates beneficial to minor adverse cumulative impacts to air quality, airspace, noise, soils, biological resources, wetlands, water resources, facilities, energy demand, land use conflict, hazardous materials and waste, and traffic and transportation. The reduction of Soldiers on Fort Wainwright would result in less training and a reduced frequency of garrison environmental support activities. When viewed in conjunction with other past, present and reasonably foreseeable projects, the overall cumulative effect of Alternative 1 are projected to be either beneficial or no more than minor adverse impacts.

As a result of Alternative 1, the Army anticipates significant but mitigable cumulative adverse impacts to cultural resources.

Cultural Resources. Potential demolition of facilities, as proposed as a result of the implementation of Alternative 1, that are eligible for listing in the NRHP and also are a part of the Ladd Field NHL, in conjunction with other historic facility disposition proposals being

considered by USAG FWA, could result in adverse effects to both the individual buildings and the NHL as a whole. Additional NEPA analysis and compliance with Section 106 and Section 110 of the NHPA would be required if a specific undertaking associated with facility demolition in support of Army 2020 reductions is proposed for Fort Wainwright.

Socioeconomics. The cumulative socioeconomic impact within the ROI under Alternative 1 would be a significant adverse impact on the regional economy. Regionally, off-post unemployment has risen within the ROI from 2008 to 2012. In conjunction with other staffing declines currently being considered by the DoD, other actions may contribute to a significant regional economic impact. Cumulatively, with a reduction of military and civilian personnel at Fort Wainwright, in combination with proposed reductions at Eielson Air Force Base, the regional economy may contract in a manner that impacts a substantial portion of the region's total revenue. A reduction of 4,915 Soldiers, civilians and their dependents in conjunction with these actions would cumulatively have a negative impact on the regional local economy.

Alternative 2: Installation gain of up to 1,000 Combat/Combat Support Soldiers resulting from Brigade Combat Team Restructuring and Unit Realignments

Cumulative impacts of Alternative 2 are projected to range from beneficial to significant but mitigable impacts. The following VEC areas that are anticipated to experience no more than a minor cumulative impact are: air quality, noise, soils, biological resources, wetlands, water resources, facilities, socioeconomics, energy demand, land use conflict, hazardous materials and waste, and traffic and transportation.

Cumulative airspace impacts would be less than significant. Cumulative impacts to cultural resources would be anticipated to be significant but mitigable.

Airspace. Additional live-fire training associated with Alternative 2 would increase the activation of SUA for military operations. This action, when considered with the Joint Pacific Alaska Range Complex proposal would add additional military airspace uses and would increase impacts, though they would remain less than significant.

4.22 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Implementation of the Proposed Actions (Alternative 1: Force Reduction of Soldiers and Army Civilians and Alternative 2: Installation Gain of Combat/Combat Support Soldiers resulting from Brigade Combat Restructuring and Unit Realignments) would result in impacts to the natural, cultural, and socioeconomic environment at each of the 21 installations evaluated.

Table 4.22-1 summarizes the intensity of impacts on a variety of VECs that would be anticipated under the No Action Alternative. The majority of potential impacts would be negligible to minor, with some less than significant impacts. Significant but mitigable impacts are anticipated to occur at: Fort Bliss for traffic and transportation; Fort Bragg for soil erosion and transportation; Fort Gordon for land use; JBER for cultural and biological resources; JBLM for water resources and socioeconomics; Fort Wainwright for cultural resources, and USAG-HI for cultural; resources, noise, soil erosion, and biological resources, and traffic and transportation (O'ahu).

Table 4.22-2 summarizes the intensity of impacts on VECs that would be anticipated as part of the implementation of Alternative 1: Force Reduction. The majority of potential impacts anticipated to VECs would be negligible to minor, and beneficial, with a few less than significant impacts. Significant but mitigable impacts are anticipated to occur at: Fort Gordon for land use; and JBER, Fort Sill ,USAG-HI, and Fort Wainwright, for cultural resources. Significant socioeconomic impacts are anticipated at: Fort Benning, Fort Bliss, Fort Bragg, Fort Campbell, Fort Carson, Fort Drum, Fort Gordon, Fort Hood, JBER, JBLE, Fort Knox, Fort Lee, Fort Leonard Wood, Fort Polk, Fort Riley, USAG-HI, Fort Sill, Fort Stewart, and Fort Wainwright.

Table 4.22-3 summarizes the intensity of impacts on VECs that would be anticipated as part of the implementation of Alternative 2: Installation Gain of Combat/Combat Support Soldiers. The majority of potential impacts would be negligible to minor, or less than significant, with some beneficial impacts. Significant but mitigable impacts are anticipated to occur at: Fort Bliss for traffic and transportation; Fort Campbell for traffic and transportation; Fort Carson for air quality, soil erosion (also at PCMS), facilities, traffic and transportation; JBER for cultural and biological resources; USAG-HI for biological and cultural resources, noise, soil erosion, facilities, water resources, and traffic and transportation (O'ahu); and Fort Wainwright for cultural resources. No significant environmental impacts are anticipated as part of the implementation of Alternative 2. Fort Riley is anticipated to experience a significant socioeconomic impact under Alternative 2 with regard to projected increases in ROI population.

No specific mitigation measures are required to reduce any impacts discussed within the VEC environmental consequences sections of each of the 21 installations to less than significant. This is because continued adherence by installations to their existing SOPs, BMPs, and installation management programs (such as ITAM, INRMP, and ESMP), and consultations with appropriate outside agencies would reduce impacts to less than significant.

The other military services will also have to make adjustments to meet the DoD budget goals discussed in Chapter 1. These may occur through changes in procurement and/or reductions in personnel. At some locations, such as the Joint Bases discussed in the PEA, those reductions, when combined with the Army reductions described in Alternative 1, could affect the cumulative impacts. As of October 2012, however, the other services could not provide any specific projections that would allow the Army to quantify or describe these cumulative impacts. This PEA analysis may assist the other services, in analyzing cumulative impacts of their proposed actions, as they prepare their own NEPA analyses.

Table 4.22-1. Potential Environmental Impacts of the No Action Alternative

Valued Environmental Component	Air Quality	Airspace	Cultural Resources	Noise	Soil Erosion	Biological Resources	Wetlands	Water Resources	Facilities	Socioeconomics	Energy Demand and Generation	Land Use Conflict and Compatibility	Hazardous Materials and Hazardous Waste	Traffic and Transportation
Fort Benning	M	M	M	LS	LS	LS	LS	LS	M	B	M	LS	M	M
Fort Bliss	M	M	N	N	M	N	N	M	N	N	N	M	M	SM
Fort Bragg	M	M	N	M	SM	N	M	N	N	M	M	M	N	SM
Fort Campbell	N	N	N	N	M	N	N	M	N	M	N	N	N	N
Fort Carson/PCMS	LS/M	N/N	N/N	N/N	LS/LS	N/N	M/N	M/N	M/N	N/N	N/N	N/N	M/M	LS/N
Fort Drum	M	N	M	N	N	M	M	N	N	M	M	N	N	M
Fort Gordon	N	N	N	N	N	N	N	N	LS	N	N	SM	N	N
Fort Hood	M	N	N	N	M	M	N	M	N	M	N	N	N	N
Fort Irwin	M	M	M	N	M	M	N	LS	M	M	N	M	M	M
Joint Base Elmendorf-Richardson	LS	M	SM	M	LS	SM	LS	M	M	B	M	M	LS	LS
Joint Base Langley Eustis	M	N	M	N	N	M	M	N	M	M	M	N	M	LS
Joint Base Lewis-McChord	LS	LS	LS	S	N	LS	N	SM	LS	SM	N	M	M	S
Fort Knox	M	N	N	N	M	N	N	M	N	M	N	N	N	N
Fort Lee	N	N	M	N	N	N	N	N	N	B	N	N	N	N
Fort Leonard Wood	N	N	N	N	N	N	N	N	N	B	N	N	N	N
Fort Polk	N	N	N	N	M	N	N	N	N	N	N	N	N	N
Fort Riley	M	N	N	N	M	N	N	M	N	B	N	N	N	N
USAG-HI (O'ahu)/(PTA)	LS/LS	M/M	SM/SM	SM/SM	SM/SM	SM/SM	M/N	M/M	M/M	M/M	LS/LS	LS/LS	M/M	SM/LS
Fort Sill	B	N	LS	SM	N	N	N	N	N	M	N	N	N	M
Fort Stewart	M	M	N	N	M	N	M	M	N	N	N	N	N	M
Fort Wainwright	M	M	SM	M	M	M	M	M	N	M	N	M	N	M

KEY: B = Beneficial, LS = Less than Significant, M = Minor, N = Negligible/No Impact, S = Significant, SM = Significant but Mitigable

Table 4.22-2. Potential Environmental Impacts of Alternative 1: Force Reduction of Soldiers and Army Civilians at Installations

Valued Environmental Component	Air Quality	Airspace	Cultural Resources	Noise	Soil Erosion	Biological Resources	Wetlands	Water Resources	Facilities	Socioeconomics	Energy Demand and Generation	Land Use Conflict and Compatibility	Hazardous Materials and Hazardous Waste	Traffic and Transportation
Fort Benning	B	M	M	M	M	M	M	M	B	S	B	M	M	B
Fort Bliss	B	M	M	B	B	B	N	B	N	S	B	M	M	B
Fort Bragg	B	M	M	B	B	B	B	B	B	S	M	M	M	B
Fort Campbell	N	N	N	N	B	N	N	B	B	S	B	N	N	B
Fort Carson/PCMS	B/B	B/B	B/B	B/B	B/B	B/B	B/B	B/B	B/N	S/N	B/N	N/N	B/B	B/B
Fort Drum	M	N	M	N	N	M	B	N	B	S	B	N	N	M
Fort Gordon	N	N	N	N	N	N	N	N	LS	S	N	SM	N	B
Fort Hood	B	N	M	N	B	B	N	B	M	S	B	N	N	B
Fort Irwin	B	B	B	N	B	B	N	B	M	LS	B	M	M	B
Joint Base Elmendorf-Richardson	B	B	SM	B	M	M	B	B	M	S	B	M	LS	B
Joint Base Langley Eustis	B	N	M	B	B	M	B	N	B	S	B	N	M	B
Joint Base Lewis-McChord	M	N	M	LS	N	B	N	B	B	LS	B	B	LS	B
Fort Knox	B	N	M	B	B	N	N	B	M	S	N	N	M	B
Fort Lee	B	N	M	B	N	N	N	N	B	S	B	B	M	B
Fort Leonard Wood	N	N	M	N	N	N	N	N	B	S	B	N	M	B
Fort Polk	B	N	N	N	N	N	N	B	B	S	B	N	M	B
Fort Riley	B	N	M	B	M	B	N	B	M	S	B	N	M	B
USAG-HI (O'ahu)/(PTA)	B/B	B/B	SM/SM	B/B	B/B	B/B	M/M	M/B	B/B	S/N	B/B	B/B	B/B	B/B
Fort Sill	B	N	SM	B	N	N	N	B	B	S	B	B	LS	B
Fort Stewart	B	N	M	B	N	B	B	N	M	S	B	B	M	B
Fort Wainwright	B	B	SM	B	M	M	M	M	M	S	B	M	N	B

KEY: B = Beneficial, LS = Less than Significant, M = Minor, N = Negligible/No Impact, S = Significant, SM = Significant but Mitigable

Table 4.22-3. Potential Environmental Impacts of Alternative 2: Installation Gain of Combat/Combat Support Soldiers Resulting from Brigade Combat Team Restructuring and Unit Realignments

1

Valued Environmental Component	Air Quality	Airspace	Cultural Resources	Noise	Soil Erosion	Biological Resources	Wetlands	Water Resources	Facilities	Socioeconomics	Energy Demand and Generation	Land Use Conflict and Compatibility	Hazardous Materials and Hazardous Waste	Traffic and Transportation
Fort Benning	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Bliss	M	M	LS	M	M	M	N	LS	N	B	M	M	M	SM
Fort Bragg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Campbell	N	N	N	N	M	N	N	M	LS	B	M	N	N	SM
Fort Carson/PCMS	SM/LS	LS/M	M/M	M/M	SM/SM	LS/LS	M/N	M/M	SM/N	B/N	M/N	M/N	M/M	SM/N
Fort Drum	M	N	M	N	N	M	M	N	M	LS	LS	M	N	M
Fort Gordon	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Hood	M	N	M	M	M	M	N	M	M	B	M	N	N	M
Fort Irwin	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Joint Base Elmendorf-Richardson	LS	M	SM	LS	LS	SM	LS	LS	LS	B	M	LS	LS	LS
Joint Base Langley Eustis	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Joint Base Lewis-McChord	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Knox	M	N	N	M	M	N	N	M	LS	B	N	M	N	M
Fort Lee	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Leonard Wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Polk	M	N	N	N	M	N	M	M	LS	N	N	M	M	M
Fort Riley	M	M	M	M	M	M	N	M	M	S	M	N	N	M
USAG-HI (O'ahu)/(PTA)	LS/LS	M/M	SM/SM	SM/SM	SM/SM	SM/SM	M/N	SM/LS	SM/SM	LS/N	M/M	M/M	LS/LS	SM/LS
Fort Sill	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fort Stewart	M	M	M	M	LS	M	M	M	LS	B	M	M	M	LS
Fort Wainwright	M	M	SM	M	M	M	M	M	M	B	M	M	N	M

KEY: B = Beneficial, LS = Less than Significant, M = Minor, N = Negligible/No Impact, S = Significant, SM = Significant but Mitigable

4.23 CONCLUSION

The PEA's analysis of the impacts associated with the implementation of the Proposed Action has not identified any significant environmental impacts, other than socioeconomic impacts, under either of the alternatives analyzed. As discussed in Section 4.22, impacts include effects to air quality, airspace, cultural resources, noise, soil erosion, biological resources, wetlands, water resources, facilities, socioeconomics, energy demand, land use, and traffic and transportation. The continued adherence to the SOPs, BMPs, and various existing installation management plans (e.g., ITAM, INRMP, and ESMP), as well as outside agency consultation would ensure that no significant impacts, other than socioeconomic impacts, would result from the Proposed Action. The PEA identifies some significant socioeconomic impacts, but these by themselves do not require preparation of an EIS. Under either alternative, no specific mitigation measures are needed to reduce the anticipated impacts to less than significant. Therefore, an EIS is not required, and a draft FNSI has been prepared. A Notice of Availability of the final PEA and draft FNSI has been published in the *Federal Register* and *USA Today*. Local announcements in the vicinities of the 21 installations analyzed in the PEA will also be made, inviting the public and all interested parties to provide comment during the 30-day review period.

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4.24 CUMULATIVE EFFECTS

4.24.1 NATIONWIDE CUMULATIVE IMPACT

In addition to the cumulative impacts discussed under each installation section, there are some resources for which the Army 2020 action as a whole could have a nationwide cumulative effect. Those resources are discussed in this section.

4.24.1.1 Greenhouse Gases and Climate Change

There is broad scientific consensus that humans are changing the chemical composition of Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of GHGs, such as CO_2, in our atmosphere. An increase in GHG emissions is said to result in an increase in the average temperature of the Earth's atmosphere and oceans, which is commonly referred to as "global warming". Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, precipitation rates, etc., which is commonly referred to as climate change. The Intergovernmental Panel on Climate Change best estimates are that the average global temperature rise between 2000 and 2100 could range from 0.6 degrees Celsius (about 33 degrees Fahrenheit) (with no increase in GHG emissions above year 2000 levels) to 4.0°Celsius (about 39°Fahrenheit) (with substantial increase in GHG emissions). Large increases in global temperatures could have considerable adverse impacts on natural and human environments.

GHGs include water vapor, CO_2, CH_4, N_2O, ozone, and several hydrocarbons and chlorofluorocarbons. Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO_2 is the second-most abundant GHG. Uncontrolled CO_2 emissions from power plants, heating sources, and mobile sources are a function of the power rating of each source, the fuel consumed, and the source's net efficiency at converting the energy in the feedstock into other useful forms of energy (e.g., electricity, heat, and kinetic). Because CO_2 and the other GHGs are relatively stable in the atmosphere and essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of these emissions does not depend upon the source location on the earth (i.e., regional climatic impacts/changes will be a function of global emissions).

Army installations produce GHGs through vehicle use, heating and cooling of buildings, electricity generation, munitions explosions, and other activities. In both of the action alternatives, the Army would reduce its Soldier strength from 562,000 to 490,000. It would also reduce employment of civilians and contractor personnel. This reduction would occur over a number of years and its effects would be felt at installations all over the country. It would mean that there will be a net reduction of vehicle engine use, of munitions use, and of energy consumption. The people, of course, would not simply disappear. People who would have been in the Army in 2020, for instance, very likely still would be living in the U.S. and would be engaged in activities that result in GHG emissions such as commuting to and from locations other than Army installations. GHG emissions would likely be marginally higher than if the Army did not implement the Proposed Action and were to continue operating some of the larger vehicles and equipment used by its Soldiers. That total difference would be hard to quantify, however. In the final analysis, the net effect of the Army 2020 transformation would be very small compared to the nation's overall GHG emissions and would have no significant cumulative effect on climate change.

4.24.1.2 Cumulative Economic Effect

The loss of approximately 72,000 Soldier jobs and additional civilian positions would have a cumulative economic effect. It is important to remember that the Soldiers in these units would

not all be suddenly discharged from the Army when their units are inactivated. Some would leave the Army through the normal course of events, to include retirement, and others would be reassigned to other units. In addition, the Army would also use involuntary separation programs and policies to reduce the size of the force. All of these should be spread over the course of the Army's realignment and reduction of its forces over a period of several years. There would not be a flood of military employees entering the job market. In addition, some people would leave the Army and go into retirement and not seek employment in the civilian job market.

Nevertheless, by 2020 there would be 72,000 people in the U.S. who otherwise might be employed as Soldiers in the Army, as well as people who otherwise might be Army civilian or contractor employees. These people would be competing in the job market and could mean that the people with whom they compete have lower paying jobs or no job at all. Of course, by the same token, some of the military employees could become entrepreneurs and create businesses that create jobs.

As of September 2012, 133,500,000 people were employed in non-farm jobs in the U.S. The reduction of the Army to 490,000 Soldiers represents about .05 percent of this total. For this reason alone, the effect would not be significant. In addition, the negative effect on nationwide employment would be offset as people with discipline and skills developed in the military enter the job force and are productively employed.

There are some states with more than one installation that have the potential for substantial losses that have been included in this analysis. These are Texas (Fort Bliss and Fort Hood), Georgia (Fort Stewart, Fort Benning, and Fort Gordon), Virginia (Fort Lee and JBLE), Alaska (Fort Wainwright and JBER) and Kentucky (Fort Knox and part of Fort Campbell). In these states, the economic impacts of the loss of employment in the individual ROIs could combine to produce a greater impact statewide. In Georgia, for instance, all three installations could see significant economic impacts, and these could have a cumulative effect on the overall state economy. Forts Stewart and Gordon are close enough that the economic impacts could combine to produce a cumulatively greater regional effect. Both of these sites already could have significant local economic effects; the cumulative effect could add to that already-significant impact. Fort Benning is far enough away, however, so that this would not happen. The installations in Texas, Kentucky, and Alaska are also distant enough from each other that a regional cumulative effect is not expected. JBLE and Fort Lee, however, are close enough that their impacts could combine to produce adverse cumulative impacts. It is possible that this could mean that Fort Lee's less than significant impacts could be amplified by force reductions at JBLE to some extent, though the ROIs of the installations do not overlap.