

DRAFT SUPPLEMENTAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR ARMY GROWTH AND FORCE STRUCTURE REALIGNMENT, U.S. ARMY PACIFIC

MAY 2008



EXECUTIVE SUMMARY

Introduction

On 12 October, 1999, the Senior Leadership of the Army articulated a vision for the Transformation of the Army to ensure that it remained an effective operational force in the 21st Century. The Army's decision to transform began a dynamic 30-year process through which the Army is continuously assessing and calibrating its force structure and capabilities to face the evolving threats and mission requirements needed to support national security. The decision to transform the Army was described in the 2002 Record of Decision for the *Programmatic Environmental Impact Statement for Army Transformation*

As part of the overall Army transformation effort, the Army has transitioned to a modular force structure. Organizationally, this has meant a transition of the Army and its focus of operations away from the Division level (10,000 to 12,000 Soldiers) to an Army designed around smaller, standardized, self-contained, rapidly deployable Brigade Combat Teams (3,400 – 4,100 Soldiers). The implementation of modular force concepts has led to force structure changes at all Army echelons of operations. In January 2007, the Army completed assessments of how to align its forces in the continental United States (CONUS) to better implement transformation, Army modularity, and support growing mission requirements of the Army. Decisions made in the January 2008 *Record of Decision for Army Growth and Force Structure Realignment* did not include final decisions for stationing and force structure modification needed to support the mission requirements of the Pacific Theater. The Pacific Theater is an active operational theater with theater-specific mission requirements. These requirements, and alternatives for implementing growth and realignment of forces to support them, are discussed and evaluated in the subsequent chapters of this document. This document serves as a supplement to the 2007 Final Programmatic Environmental Impact Statement for Army Growth and Force Structure Realignment

In order to further Army Transformation, meet the increased national security and defense requirements of the 21st century, maintain training and operational readiness levels of the force, and preserve a high quality of life for U.S. Army Soldiers and Families, the Army has identified the need to modify its existing force structure and increase its overall size to support Pacific Theater operations while continuing to restructure its forces in accordance with modular Transformation decisions.

The Army's Proposed Action is to grow, realign, and transform Army forces to support Pacific Theater operations and to ensure the proper capabilities exist to sustain operations for promoting global, regional, and national security now and into the foreseeable future. The implementation of the Proposed Action is needed to better meet military operational needs, national and regional security requirements, and the needs of the Army's Soldiers and their Families to ease the burden of repeated deployments.

This analysis includes the evaluation of installations capable of supporting Pacific Theater operations and incorporates the Army's *Final Programmatic Environmental Impact Statement (PEIS) for Army Growth and Force Structure Realignment* (October, 2007) by reference. In addition the major training installations evaluated in the FPEIS, the Army is considering additional installations in the Pacific Theater which may receive 1,000 or more new Soldiers from 2008 through 2013 to support the Proposed Action discussed above. These installations

1 include Fort Richardson, Alaska; Fort Wainwright, Alaska; Schofield Barracks Military
2 Reservation (SBMR) HI; and Fort Shafter, Hawai'i.

3
4 This analysis does not include analysis of the stationing of new Brigade Combat Teams (BCTs)
5 to support Pacific Theater operations. As part of decisions related to the Army's 2008 Record of
6 Decision for Army Growth and Force Structure Realignment the Army made decisions to grow
7 by 6 BCTs. All combat maneuver BCTs have been allocated to locations within the Continental
8 US. Additional BCT stationing actions are not included as part of the Proposed Action and are
9 not evaluated in this document as part of alternatives considered.

10
11 Three alternatives and the "no action" alternative have been analyzed in this Supplemental
12 PEIS for implementing the Proposed Action. This Supplemental PEIS (SPEIS) evaluates
13 different stationing scenarios, to include stationing of units at locations within CONUS.

14
15 The Army's decision-maker will consider the environmental and public issues of concern
16 disclosed in this SPEIS before making final force structure decisions to support the Proposed
17 Action. After evaluating information presented in this SPEIS, the decision-maker will document
18 the decision, selecting one of the alternatives for implementing the Proposed Action in a Record
19 of Decision (ROD). By regulation, this document will be signed no earlier than 30 days from the
20 publication of the Notice of Availability of the Final SPEIS. The ROD will clearly and definitively
21 articulate the decision made and provide a supporting explanation. It will explain both the
22 significant factors he relied on in making a final decision and why the final alternative best meets
23 the purpose and need. The decision-maker will acknowledge the comparative environmental
24 impacts and benefits resulting from his decision particularly if the alternative selected is not the
25 environmentally preferred alternative. The ROD will be made available to the public when it is
26 finalized.

27 28 **ALTERNATIVES**

29
30 Three action alternatives have been formulated to take into account the Army's needs for
31 growth and force structure realignment to support Pacific Theater mission requirements.
32 Common elements to these alternatives include the growth and force structure realignment of
33 Army units from the fiscal year 2008 to 2013. All alternatives consider BRAC directed actions
34 and those stationing actions that have occurred prior to the start of Fiscal Year 2008 as part of
35 the baseline condition for analysis. Alternatives carried forward for analysis in this SPEIS
36 include:

37
38 ***Alternative 1- Grow, transform, and realign forces to support operations in the Pacific***
39 ***Theater by implementing Army-wide modular force recommendations to modernize the***
40 ***force structure of existing units.*** Modularity-based recommendations as part of this
41 alternative include adjustments in the number and type of existing CS, CSS, and Headquarters
42 units stationed in the Pacific Theater. As part of this alternative, Army installations would
43 experience unit gains through stationing and transfer of units from other installations, and losses
44 through deactivations and transfers of existing units to other installations. This alternative would
45 serve to implement modular force recommendations at PACOM installations that the Army is in
46 the process of implementing across the organization.

47
48 ***Alternative 2- In addition to those stationing actions in Alternative 1, the Army would***
49 ***station additional units needed to meet the specific mission requirements of the Pacific***
50 ***Theater.*** As part of Alternative 2, the Army would grow and realign its forces to support the
51 mission requirements of the Pacific Theater. Critical Army units include a theater engineer

1 command and supporting engineer units, a military police brigade and support units, and other
2 high-demand CS units. An additional engineer brigade headquarters and engineer support
3 units are required to support the theater's large disaster relief response requirement for
4 construction engineers. In addition an engineer brigade headquarters will provide command
5 and control functions for existing engineer battalions in Alaska and Hawai'i.

6
7 ***Alternative 3- Take actions to grow, transform, and realign Army forces to support Army***
8 ***modularity and Pacific Theater operations as discussed in Alternatives 1 and 2; in***
9 ***addition to these actions grow the Army to accommodate the stationing of a Maneuver***
10 ***Enhancement Brigade, a Fires Brigade, and a Combat Aviation Brigade to enhance***
11 ***PACOM operations and combat support capabilities in the Pacific Theater.*** Alternative 3
12 includes implementing the recommended stationing actions of all of the programs discussed
13 above as part of Alternatives 1 in addition and the growth discussed in Alternative 2. In addition,
14 the Army would also station three multi-functional support brigades to support operations in the
15 Pacific Theater. These brigades would include a Fires Brigade (approximately 1,600 Soldiers),
16 a Maneuver Enhancement Brigade (approximately 570 Soldiers), and a Combat Aviation
17 Brigade (approximately 2,500-2,900 Soldiers). These units provide additional flexibility and
18 depth to the available force pool and would provide the Pacific Theater with increased
19 capabilities to respond to a wide array of contingencies. These units could be stationed in
20 Hawai'i, Alaska, or other locations in CONUS that are capable of deploying forces to support
21 Pacific Theater operations.

22
23 ***No Action Alternative- The No Action Alternative is to take no stationing actions to***
24 ***support growth, realignment, and transformation of the Army to support operations in***
25 ***the Pacific.*** The No Action Alternative serves as a baseline condition for analysis. The No
26 Action alternative includes those stationing decisions that have already been made to include
27 stationing actions recommended by the BRAC Commission (BRAC 2005), as well as Army
28 Global Defense Posture Realignment actions that took place prior to 2008. The No Action
29 Alternative does not implement the most recent Army transformation and modular force
30 recommendations.

31 32 **SCREENING CRITERIA FOR STATIONING LOCATIONS**

33
34 The Army initially included all of its installations as potential stationing locations to support
35 growth, transformation, and realignment to support Pacific Theater operations. Installations that
36 do not have access to adequate modernized range facilities and training land were excluded
37 from analysis. Overseas installations and those installations that do not have permanent party
38 infrastructure or services have also been screened from further consideration. A fuller
39 discussion of screening criteria is provided in Chapter 3 of the SPEIS.

40 41 **SPEIS METHODOLOGY**

42
43 Chapter 4 of the SPEIS analyzes the potential impacts resulting from implementing various
44 stationing scenarios to support the Proposed Action. There are six stationing scenarios the
45 Army has assessed in the SPEIS that are designed to inform the decision-maker and provide
46 him with flexibility in implementing alternatives. Stationing scenarios have been evaluated at a
47 given installation if the Army has determined that the scenario might feasibly be implemented to
48 support the Proposed Action. Stationing scenarios include the stationing of additional Combat
49 Support (CS) units with approximately 1,000 Soldiers, Combat Service Support (CSS) units with
50 approximately 1,000 Soldiers, Combat Support units having approximately 3,000 Soldiers,
51 Combat Service Support units with approximately 3,000 Soldiers, a Fires Brigade having

approximately 1,600 Soldiers, and a Combat Aviation Brigade (CAB) consisting of approximately 2,800 Soldiers. Combat Support units include Military Police (MP), Explosive Ordnance Disposal (EOD), Chemical Defense, and Engineer Soldiers. Combat Service Support units provide logistical capability and may be comprised of Transportation, Quartermaster, Headquarters, and Medical functions. The Fires Brigade and Combat Aviation Brigade scenarios are based on the Army Modular Force organization which offers self-sustaining unit capability, equipment, and manning.

All scenarios are not evaluated at all potential stationing locations, but take into account the capacity of the installation and the Army's force structure management needs. For example, the Army has determined that the stationing of more than 1,000 Soldiers at Fort Shafter, Hawai'i, or of a Fires Brigade in Hawai'i are not feasible scenarios that would be implemented to support the Proposed Action. Stationing scenarios evaluated in Chapter 4 are designed to provide decision-makers with awareness of potential environmental issues and impacts now and in the near future, and should not be interpreted as representing the Army's plan for supporting growth and realignment in the Pacific Theater.

SIGNIFICANT ENVIRONMENTAL AND SOCIO-ECONOMIC CONSEQUENCES

Tables ES-1 through ES-6 provides a summary of potentially significant environmental and socio-economic consequences that would be projected to occur for each of the installations that have been carried forward for analysis in the SPEIS. This analysis supplements analysis of environmental impacts connected with Army stationing that was provided in the Army's PEIS for Army Growth and Force Structure Realignment (October 2007). The Army has coordinated with installation staff at each potential stationing location to assess anticipated impacts from different unit stationing scenarios. Significant environmental and socio-economic impacts connected with various stationing scenarios are discussed below.

Summary of Potentially Significant Impacts

Scenarios 1 & 2

Stationing of an Additional 1,000 Combat Service Support (CSS) or Combat Support (CS) Soldiers. A majority of installation impacts analyzed within this SPEIS result from the accommodation of training and construction activities and are anticipated to be less than significant in nature. CSS units consist of transportation, maintenance and quartermaster battalions, companies and other attachments that provide storage, control, distribution and repair/maintenance of general military supplies and equipment. Surface transport of supplies and equipment and other logistics functions provided by these units is typically accomplished using light, medium and heavy tactical trucks. Combat Support Units consist of Engineer, Military Police (MP), Chemical Defense, and Explosive Ordnance Disposal (EOD) brigades, battalions, companies and attachments. The units are equipped with light, medium, and heavy tactical trucks and various types of earth moving equipment (ex. bulldozers, and road graders). While CSS and CS units are capable of off-road maneuver, typically, training occurs on roads and hardened surfaces, and live-fire training typically involves small arms training.

Potentially significant impacts to Air Quality, Facilities, Land Use Conflict and Compatibility, and Socioeconomics could occur as a result of implementing stationing scenarios 1 or 2 and are summarized below:

Air Quality. Significant impacts may occur at Fort Wainwright, Alaska (FWA). FWA is classified as a “major” facility because it is within the boundary of the former carbon monoxide (CO) non-attainment area. FWA is also classified as a Prevention of Significant Deterioration (PSD) Major Facility; and it is currently classified as a major stationary source under Title I (Part D) and Title I (Part C) of the Clean Air Act (CAA); Section 112 air toxics program; and the Title V Operating Permit program. The use of boiler units and generators used in new facilities (as a result of stationing new units), and the use of transportable generators during training operations, may require FWA to apply for a major or minor air quality permit. If either of these stationing scenarios are selected. The installation may need to undergo a conformity review and an air conformity determination may be required.

Facilities. There may be significant impacts at Fort Shafter due to limited available cantonment space and capacity to accommodate new construction. The installation does not currently have adequate vacant space to support the required facilities for a Combat Support or Combat Service Support unit without deconstructing/demolishing existing aging facilities. It is anticipated that construction to support growth may require the use of modular facilities until construction is complete. Flood control measures may also be required to proximity to waterbodies.

Land Use Conflict and Compatibility. There may be significant impacts at Fort Shafter. The land available for construction outside the main post is primarily mountainous with little topographic relief, which poses a challenge to construction planning. Few other parcels of land is available for construction. Those that are available are located within the main post at Shafter Flats.

Socio-economics. Significant impacts (adverse and beneficial) may occur at FWA. New units would provide some economic stimulus to the local economy but would also increase the demand for local services. The addition of unit strength may drive some limited economic stimulus in the local Fairbanks economy. The additional Soldiers and their Family members would slightly increase the business volume in Fairbanks.

Scenarios 3 & 4

Stationing of an Additional 3,000 Combat Service Support (CSS) or Combat Support (CS) Soldiers. A majority of installation impacts analyzed within this SPEIS result from the accommodation of training and construction activities and are anticipated to be less than significant in nature. CSS and CS weaponry and equipment is described in Scenarios 1&2 above.

Potentially significant impacts to Air Quality, Facilities, Traffic and Transportation, Land Use Conflict and Compatibility, and Socioeconomics could occur as a result of implementing stationing scenarios 3 or 4 and are summarized below:

Air Quality. At FWA, implementation of either of these stationing scenarios would increase the Soldier and Family population at FWA by approximately 50 percent. The use of boiler units and generators, coupled with increased steamload or coal consumption at the installations’ power plant would considerably contribute to the installation’s overall air pollutant emissions, further degrading air quality.

Facilities. Fort Richardson Alaska (FRA) may experience significant impacts due to a lack of vacant space in the existing cantonment area. The installation would need to consolidate units at an area away from the main cantonment area of approximately 200 acres in size.

Construction would involve all new facilities including headquarters buildings, motorpools and maintenance, new utility (power, water, wastewater) distribution and collection lines, and telecommunication. Due to the amount of construction that would be required, additional coordination with commercial contractors, planners, and state and federal agencies may be needed for permitting and consultation.

Traffic and Transportation. FRA may experience significant impacts. There would be an expected shortfall of organizational and motorpool parking associated with this level of Soldier strength. On-post traffic patterns may need to be reconsidered as well as gate modifications to gate operations. Traffic conditions off-post may be exacerbated during the spring and summer when Anchorage and surrounding areas experience its greatest amount of tourism.

Socio-economics. The schools around FWA would experience significant growth in the population of school aged children relative to the existing population. This increase could lead to an increase in student to teacher ratio or could lead to other issues, particularly in elementary grade levels where a bulk of military dependent children would attend schools. There may also be a shortage in off-post housing, although there may be vacant buildable space available. New units would likely contend with a higher cost of living than what they may normally be accustomed to at other stationing locations. Beneficial effects would be expected as additional Soldiers and Families may have some economic stimulus in the local economy.

Scenarios 5

Stationing of 1,600 Soldiers associated with a Field Artillery (Fires) Brigade. Installations' impacts that result from training and construction are generally anticipated to be significant but mitigable to less than significant. The fires brigade uses mounted and towed artillery to provide close support and precision strikes. The Brigade employs artillery within the unit but also can control and direct the fires of other armed forces or coalition partners. A Fires Brigade with high mobility artillery rocket system and 1.55 howitzers consists of approximately 1,600 Soldiers, vehicles, and equipment.

Potentially significant impacts to Air Quality, Facilities, and Socioeconomics could occur as a result of implementing stationing scenario 5 and are summarized below:

Air Quality. Under this stationing scenario, the Soldier and Family population would increase by approximately 25 percent at FWA. Given regional air quality conditions, implementation of this stationing scenario is anticipated to have significant impacts from stationary source emissions.

Facilities. Similar to scenarios 3 & 4, siting of new facilities at FRA is expected to involve new facilities and new infrastructure in an area away from the existing cantonment area.

Socio-economics. Schools around FWA and Fairbanks would experience a sizeable amount of student growth relative to the current school aged population, and housing to support an influx of Soldiers and Families would be in high demand. Beneficial effects would occur to the local economy and from the generation of potential employment opportunities.

Scenario 6

Stationing of approximately 2,800 Soldiers associated with a Combat Aviation Brigade (CAB). The impacts expected from stationing an additional Combat Aviation Brigade at Schofield Barracks are generally anticipated to have significant but mitigable to less than significant effects. Aviation Brigades typically consist of 80 - 100 helicopters that require a

1 variety of live-fire training and maneuver support training requirements. As part of this
2 stationing scenario, equipment would operation out of Wheeler Army Airfield. Impacts would
3 result from construction of new facilities and training activities.
4

5 Potentially significant impacts to Biological resources could occur as a result of implementing
6 stationing scenario 6 and are summarized below:
7

8 **Biological Resources.** The level of training activity associated with a Combat Aviation Brigade
9 would increase in intensity at Pohakuloa Training Area (PTA). Because live-fire training using
10 various types of ordnance would occur more frequently, the occurrence of wildfire may increase
11 within the impact area of PTA. While the installation could take measures to mitigate the level of
12 impact of wildfires, it remains a significant impact the Army would anticipate given the sensitivity
13 of local plant populations and high levels of endemism encountered on the islands of Hawai'i.
14 Wildfire events open up opportunities for colonization by invasive non-native vegetation in
15 Hawai'i. The severity of impact of wildfire and probability of wildfire caused by CAB training at
16 PTA could not be mitigated to less than significant.
17
18

VEC Impact Summary Tables

A consolidated table of significant impacts is summarized below in tables ES-1 through ES-6 below. These tables provide an overview of anticipated significant impacts in connection with each stationing scenario at new installations analyzed in the SPEIS. Less than significant impacts and impacts to major training installations analyzed in the PEIS are not captured in the Executive Summary tables below. Tables 4.0-1 through 4.0-6 in Chapter 4 of this SPEIS provide a comparison of all of the anticipated impacts from each of the six stationing scenarios.

The symbols below indicate the intensity of impact on Valued Environmental Components (VEC). Tables (found in Chapter 4) and the environmental consequences or “analysis of impacts” also found in Chapter 4.

Description of VEC Impact Ratings

Impact Symbol	VEC Impact Intensity Rating
○	No impact, minimal or minor impacts are anticipated
⊙	Less than Significant
⊗	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

These ratings assess the composite intensity of impacts to the installation by individual VEC resulting from i) garrison construction, ii) training infrastructure construction, iii) live-fire training, and iv) maneuver training associated with each of the stationing scenario.

While there are variations in the impacts from each of the unit stationing scenarios to the installations identified, generally, the broad comparison of these impacts demonstrate patterns of expected impacts from each of the stationing scenarios.

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Table ES-1. Combat Service Support (CSS) Scenario Summary of Potential Effects (1,000 Soldiers)

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality					⊗	
Facilities		⊗				
Land Use Conflict / Compatibility		⊗				
Socioeconomics					⊗	

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Table ES-2. Combat Support (CS) Scenario Summary of Potential Effects (1,000 Soldiers)

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality					⊗	
Facilities		⊗				
Land Use Conflict / Compatibility		⊗				
Socioeconomics					⊗	

Table ES-3. Combat Service Support (CSS) Scenario Summary of Potential Effects (3,000 Soldiers)

VEC	Location				
	Schofield Barracks	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality				⊗	
Facilities			⊗		
Traffic and Transportation			⊗		
Socioeconomics				⊗	

Table ES-4. Combat Support (CS) Scenario Summary of Potential Effects (3,000 Soldiers)

VEC	Location				
	Schofield Barracks	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality				⊗	
Facilities			⊗		
Traffic and Transportation			⊗		
Socioeconomics				⊗	

**Table ES-5. Fires Brigade Scenario Summary of Potential Effects
(1,600 Soldiers)**

VEC	Location		
	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality		⊗	
Facilities	⊗		
Socioeconomics		⊗	

**Table ES-6. Combat Aviation Brigade (CAB) Scenario
Summary of Potential Effects (2,800 Soldiers)**

VEC	Location	
	Schofield Barracks	Pohakuloa Training Area
Biological Resources		⊗

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2

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Supplemental Programmatic Environmental Impact Statement
Army Growth and Force Structure Realignment
U.S. Army Pacific

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1.0 PURPOSE, NEED AND SCOPE

1.1 Introduction

This Supplemental Programmatic Environmental Impact Statement (SPEIS) conducts an analysis of alternatives for supporting the growth, realignment, and transformation of the Army to support operations in the Pacific Theater. The Army's purpose and need for taking action is to balance and better align its forces to address existing military skills and capabilities shortfalls to support operations of the Pacific Command (PACOM). The SPEIS will provide a top-tier perspective that will provide the decision-maker, regulatory agencies, and the public with information on the potential environmental and socioeconomic effects resulting from stationing new units, to include Soldiers, Families, and equipment, at locations that can support the needs of the PACOM. This SPEIS will allow the decision-maker to compare alternatives and assess environmental and socioeconomic impacts for implementing Army growth initiatives and enable him or her to make informed decisions when choosing locations at which to station Army units.

PACOM is a joint combatant command (containing all armed services) that reports directly to the Secretary of Defense and the President. With headquarters in Hawai'i, its area of responsibility includes over 50% of the earth's surface, stretching across the Pacific and from Antarctica to the Arctic Ocean. This area, known as the Pacific Theater, includes 39 countries. Among these are India, China, Japan, both Koreas, the Philippines, and Australia. The U.S. Army Pacific (USARPAC) is the Army component of PACOM and supports the same area of operations. USARPAC is headquartered in Hawai'i but includes Army elements in Alaska. USARPAC includes the 8th Theater Sustainment Command, also stationed in Hawai'i. In addition to supporting PACOM, USARPAC must also support other Combatant commands around the world. Currently, this includes support to Central Command operations in Iraq and Afghanistan.

The Army completed a Programmatic EIS (PEIS) for Army Growth and Force Structure Realignment in October 2007 and published its decisions in January 2008. That document considered the stationing of units at locations in the Continental United States exclusive of Alaska (CONUS) but did not consider the growth and realignment of forces needed to support the operations in the Pacific Theater. For this active operational theater, Army force management decisions must carefully weigh additional considerations, such as strategic deployment and rapid contingency mission response, in addition to the factors the Army considers when stationing its forces to support general force readiness and sustainment operations. This SPEIS evaluates the potential environmental impacts associated alternative stationing scenarios designed to support operations in the Pacific Theater.

The Army is in a period of critical transition. On 12 October, 1999, the Secretary of the Army and the Army's Chief of Staff articulated a vision for the Transformation of the organization to ensure it remained an effective and relevant operational force in the 21st Century. The leadership of the Army recognized the emerging need to shift from a Cold War focus to meet new unconventional threats to national security, and a decision was made to begin the 30 year process of transforming the Army that was described in the 2002 Record of Decision for the PEIS for Army Transformation. Since this decision, the Army has completed the initial phases of this Transformation effort and is continuing to implement those actions that are needed to field a force that is best configured to meet the evolving national security and defense requirements of the 21st century.

The Army continues to conduct detailed planning to effectively carry out transformation in a way that addresses capabilities shortfalls of the cold war force and implements the guiding recommendations of the Quadrennial Defense Review (QDR). The Army's guiding document for the implementation of this plan is the Army Campaign Plan (ACP). The ACP directs the detailed planning, preparation, and execution of a full range of transformation tasks that are underway to ensure the synchronization of transformation activities across all facets of the organization. The ACP is an evolving document that changes and adapts to lesson's learned from the Army's most recent operational experience and the recommendations put forth in the QDR.

As part of the overall Army transformation effort, the Army has transitioned to a modular force structure. Organizationally, this has meant a transition of the Army from large, powerful, fixed organizations constituted at the Division level (10,000 to 12,000 personnel) to an Army designed around smaller, standardized, self-contained, rapidly deployable Brigade Combat Teams (BCTs). The implementation of modular force concepts has led to force structure changes at all Army echelons, to include organizational changes all the way up to Theater Command level. The transformation of the Army's BCTs to a standardized structure is almost complete. The Army has completed assessments of how to align its Combat Support (CS), Combat Service Support (CSS), and higher headquarters units to best support to its combat forces. Realignment of CS/CSS units is required to support PACOM's operational needs and is discussed and evaluated along with those programs that further implement modular forces concepts in the subsequent chapters of this document.

In order to further Army Transformation, meet the increased national security and defense requirements of the 21st century, maintain training and operational readiness levels of the force, and preserve a high quality of life for U.S. Army Soldiers and Families, the Army has identified the need to increase its overall size to support the operations of PACOM and other Army missions, while continuing to restructure its forces in accordance with modular Transformation decisions. This increase in the numbers and configurations of units will enhance readiness in the Pacific Theater by allowing Soldiers more time to train and maintain their equipment, it will provide Soldiers and Families more time together at home station, and it will provide Commanders with greater capability to respond to increasing regional security challenges.

The Army's Proposed Action is to grow, realign, and transform its forces to support PACOM operations and to ensure the proper capabilities exist to sustain operations for promoting global, regional, and national security now and into the foreseeable future. The implementation of the Proposed Action is needed better to meet military operational needs, national and regional security requirements, and the needs of the Army's Soldiers and their Families to ease the burden of repeated deployments.

1.2 Need for the Proposed Action

This section of the document presents and discusses the Army's need for growth, continued transformation, and realignment of its current forces to support operations in the Pacific Theater and other Army missions. This discussion references several underlying source documents that must be discussed in order to place the full need and purpose for the Proposed Action in its proper context. Source documents referenced in this section include the National Security Strategy (NSS), the National Defense Strategy (NDS), the Quadrennial Defense Review (2006), and the ACP. The growth and realignment of Army forces must meet the requirements defined in these guiding national security and defense policy documents, which lay the framework for the Army mission and how the United States will utilize its military to deter conflict and shape the global security environment. In addition to discussing the Army's requirements to take

action from an organizational perspective this section also discusses the needs of individual units as well. The implementation of growth, transformation, and restructuring to support PACOM operations must be considered in the context of several major ongoing initiatives including Army modular Transformation; those moves directed by the Defense Base Closure and Realignment Act of 1990, implemented by Base Realignment and Closure commission recommendations of 2005 (BRAC 2005); and Global Defense Posture Realignment (GDPR).

1.2.1 Need for Growth, Transformation, and Realignment to Support PACOM Operations

The need for the Proposed Action consists several elements. Across the Army, the organization is adding new units, reconfiguring existing units, and upgrading capabilities to best meet its operational and readiness needs. For USARPAC, with theater specific needs, the Army must tailor forces to accomplish the missions that it is most likely to encounter in its Area of Responsibility in the Pacific Theater.

The broader Army-wide component of need discussed in the previous paragraph was best summarized by the Chief of Staff of the Army's (CSA) 2007 assessment of the disposition of the Army that stated the following:

"The need for Army growth is driven by the fact that the current operational demand is greater than the Army's sustainable supply of forces. Because of shortages in people, equipment and time to train, the non-deployed force does not meet readiness goals. As a result, the Army lacks strategic depth to respond to new contingencies, and generating forces to meet demands, which results in short term stress and long term institutional risk. These are symptoms of a larger strategic problem: the Army's strategic requirements and resources are not in balance." (General Casey, Chief of Staff of the Army [Army Initiative Charter, April 2007])

As a result of the imbalance between current mission requirements and available forces, the Army has defined the growth and restructuring to meet the greater demands of the current security environment as its top priority (CSA, 2007).

The need for the Proposed Action focuses on three primary areas. These areas of need include:

- **Supporting increased security and defense mission requirements.** The NSS and NDS provide a framework which directs Army mission requirements and contingency planning. The Army must be able to meet the nation's security and defense policy objectives as defined in these documents while continuing to implement recommendations for Army Transformation as defined in the QDR in 2001 and 2006. The ACP is the Army's guiding document for managing the force and carrying out recommendations put forth in the QDR.
- **Sustaining Force Readiness.** Sustaining the force entails ensuring that the Army consists of enough Soldiers to support both operational deployment requirements and home station training and equipment maintenance activities. Striking the proper balance of deployments with these activities is critical to ensure a professional, well-trained, and well-equipped force can consistently meet unit readiness standards and successfully accomplish the national security and defense missions of the nation.
- **Preserving Soldier and Family Quality of Life and the All Volunteer Force.** Keeping a long-term sustainable balance between the operational activities is required to support

U.S. Security and quality of life for Soldiers and their Families. A larger pool of available forces will allow the Army to set more sustainable ratios of home-station time versus time spent deployed to support mission requirements abroad. This reduces stresses placed on individual Soldiers and their Families and allows Soldiers to maintain a higher quality of life at home station. Taking care of Soldiers and their Families is a critical element of need and will help to ensure the Army is capable of maintaining an all-volunteer force by encouraging Soldier retention and attracting new recruits.

1.2.2 Supporting Increased Security and Defense Mission Requirements

The Army is established as a land-based military force, and its forces are to be organized, trained, and equipped to represent the nation's global security and defense interests around the world. The Army does this primarily through prompt intervention and sustained combat, peacekeeping, and support and stability operations in key regions of interest defined by national strategic policies and objectives. Key policy documents for national security and national defense include the NSS (March 2006), the NDS (March 2005), and the QDR (February 2006). As Commander in Chief of the Armed Forces, the President of the United States in conjunction with his security advisors, promulgate and define national security and defense policy from within the executive branch of government. Using these defense policy documents for strategic guidance, military commanders conduct contingency planning to ensure that their forces are able to respond to crises, shape the global security environment, and implement security and defense policies in their regions of interest. The Army is responsible for the implementation of national security and defense policy as outlined in these over-arching security and defense policy documents by the executive branch of the government.

1.2.2.1 National Security Strategy

The President of the United States establishes the nation's goals and objectives for promoting secure global conditions and for shaping of the global security environment. The NSS establishes the policy goals and objectives that begin to shape mission requirements for the Department of Defense (DoD) and Department of the Army (DA). NSS goals include:

- 1) Disrupting and destroying terrorist organizations with global reach.
- 2) Denying terrorist groups the support and sanctuary provided by rogue states.
- 3) Preventing and resolving regional conflicts.
- 4) Intervening in regional conflict to promote stability where necessary.
- 5) Assisting in post-conflict stabilization when necessary.
- 6) Preventing Nuclear Proliferation.
- 7) Preventing tyranny, oppression, and genocide.

These goals provide direction and guidance to inform DoD and DA Commanders and strategic planners to establish the NDS and plan for strategic mission requirements.

1.2.2.2 National Defense Strategy

The NDS outlines how DoD will support broader U.S. efforts to create conditions conducive to a secure international system as outlined in the President's NDS. The NDS strives to maintain international sovereignty, representative governance, peaceful resolution of regional disputes, and open and competitive markets. Specifically, the NDS and the National Military Strategy, a policy document that supports it, seek to ensure the U.S. focuses its efforts on four strategic objectives. These objectives are:

1) **Secure the U.S. from Direct Attack.** This military objective includes the dissuasion, deterrence, and defeat of organizations and states that seek to harm the U.S. and its citizens directly.

(2) **Secure and Retain Strategic Access for Global Freedom of Action.** Strategic access ensures the U.S. can access key regions of interest, access lines of communication and promote and influence the global security environment and the goals outlined in the NSS for itself and its allies.

(3) **Strengthen Alliances and Partnerships.** A secure international system requires collective action. The U.S. has an interest in broad-based and capable partnerships with like-minded states. This objective seeks to strengthen security relationships with traditional allies and friends, developing new international partnerships, while working to increase the capabilities of our partners to contend with common challenges.

(4) **Establish Favorable Security Conditions.** The objective directs the DoD counter aggression or coercion targeted at U.S. partners and interests. Further, where dangerous political instability, aggression, or extremism threatens fundamental security interests, the U.S. will act with others to strengthen peace. Specifically, the U.S. military will conduct planning to create favorable international conditions and broad, secure, and lasting peace.

1.2.2.3 PACOM Commitments to Support NSS and NDS

To support national security goals and objectives, PACOM must be prepared to handle contingencies involving a number of potential conflict and peace support / humanitarian assistance scenarios. PACOM must have the appropriate number and type of forces not only to support global operations such as the wars in Iraq and Afghanistan, but must also have the forces necessary to implement security policy across the Pacific Rim. Some of the strategic concerns and mission requirements in the region include but are not limited to:

- The U.S. commitment to the defense of Taiwan
- The U.S. commitment to Japan and South Korea in containment of North Korean aggression
- The U.S. commitment to deterring North Korean nuclear advancement
- The U.S. commitment to deterring sanctuary for terrorist organizations and preventing the safe harbor for terrorist organizations and growing insurgency in Indonesia, the Philippines, and other areas of growing unrest in Southeast Asia
- The U.S. commitment to allaying ethnic conflict in Indonesia
- The U.S. commitment to supporting democracy in Southeast Asia

- The U.S. commitment to peace support and humanitarian assistance missions in the region

1.2.2.4 The Quadrennial Defense Review (2001, 2006)

The QDR sets forth a specific series of recommendations for implementing the goals and objectives of the NSS and NDS. These recommendations are specific capabilities-based recommendations for each service of the DoD that take into account current capabilities and future projected military requirements that will be needed to implement the NSS, NDS, and provide for global security and the nation's strategic interests. The QDR is required by 10 USC 118, which directs the Secretary of Defense to assess defense strategy and force structure every four years on a 20-year planning horizon. Based on this assessment, the DoD reorients its capabilities better to meet national security demands. The QDR in 2001 prescribed recommendations for the Army to transform its forces to become more relevant to shaping the 21st Century global security environment. These recommendations provided a framework for Army units/organizations to become a more transportable, agile, maneuverable force with more firepower, technology, and logistical sustainability than the forces that existed. The DoD and DA, informed by experiences in Afghanistan and Iraq, revised and submitted the QDR to Congress in 2006. The recommendations continue to emphasize the need for Transformation and growth of U.S. ground forces. These recommendations put forth in the QDR follow two major DoD imperatives:

1) Continue to reorient the Department's capabilities and forces to be more agile in current international conflicts while preparing for broader asymmetric threats from unconventional enemies to hedge against uncertainty over the next 20 years.

2) Implement enterprise-wide changes to ensure that organization structures, processes, and procedures effectively support DoDs strategic direction.

Specific QDR decisions direct DA to accelerate the Transformation of joint ground forces capabilities. QDR decisions and directives that specifically relate to Army growth and restructure include:

1) Transform Army units and headquarters to modular designs.

2) Continue to standardize brigades through Army Modularity in all three Army components (Active, Reserve, and National Guard).

3) Incorporate technology improvements and Future Combat Systems (FCS) improvements through a spiraled development and fielding process to introduce new technologies as they develop.

4) Expand joint tactical air/ground operations and double the coverage capability of unmanned aerial vehicles to include the Predator and Global Hawk.

5) Further increase the capability, capacity, and numbers of special operations force personnel and increase active duty special forces battalions by one-third.

6) Improve intelligence, surveillance, and reconnaissance technologies, information sharing capabilities, and joint command and control.

7) Achieve Net-Centricity and information connectivity on the battlefield by improving tactical satellite communications, strengthening network capability, and increasing communications capability and bandwidth.

These decisions and directives establish the strategic national security and defense framework that influence and direct the Army's decision on growth and restructuring. Ultimately, the nation's top defense professionals, its senior military leadership, assess and balance defense policy to manage the growth and restructure of the Army according to these policies.

1.2.2.5 Army Transformation & Modularity

On 12 October 1999, the Secretary of the Army and the Army's Chief of Staff articulated a vision for Transformation of the Army to ensure it remained a ready and relevant land-power for the 21st Century. There was a recognized and emergent need to shift from a Cold War focus to meet new and diverse threats to national security. To accomplish this, the Army initiated a 30 year process of Transformation, proceeding in phases from the existing force (Initial Phase), to an interim force (Interim Capability Phase) and ultimately a future force (Objective Phase). This process will pervade and force change in every element of the Army including leadership development, training and doctrine, force structure and stationing, weaponry, and installation infrastructure.

The ACP and the Army's strategy for implementing Transformation directives of the QDR provide a context for understanding why the Army is transforming and the ultimate need for Army growth and restructuring. The ACP serves as the Army's roadmap to implementing the goals and objectives put forth in the QDR and its overarching planning document that guides Army Transformation. The QDR and ACP direct the Army to transform to a highly expeditionary force, or one which is capable of supporting itself in a combat environment without depending on continual supply and logistics support. In addition, the QDR directed the Army to integrate with the U.S. Air Force, Navy, Marine Corps, and Coast Guard capabilities to provide greater inter-operability and communication to enhance defense capability. These recommendations build on previous Transformation actions taken by the Army to convert to standardized, self-sustaining, modular BCT configurations.

To implement decisions made in the QDR, senior Army leadership is responsible for developing and managing the Army's modular force structure. The process of Army force management is not a static process and force management decision-making is an evolving process that is based on changing global conditions and mission requirements. As mission requirements change, Army leadership has recognized the need to re-evaluate continually the size and unit composition of the modular force. This evaluation and determination to change the size or structure of the modular force will take mission requirements into account and will build previous decisions that direct the Army and its units in the Pacific to transform to a modular force.

Modularity. All combat units, higher headquarters units, and support units are transitioning to a modular force structure. Modular units will be similar in function and in their equipment and manning across the Army. The modular initiative allows for greater levels of planning and organizational efficiency in equipping and fielding of Army units organization-wide. The modular initiative allows the Army to evolve more quickly in response to operational needs and security challenges.

1 Army modularity is based around modular BCTs, which are the primary combat maneuver units
2 of the Army. The three primary types of BCTs include the Infantry BCT, the Stryker BCT, and
3 the Heavy BCT. In addition to the BCTs, which represent the Army's primary ground combat
4 forces, there are 5 other types of support brigades that support Theater operations. At a
5 minimum, these supporting brigades consist of a modular standardized headquarters, which has
6 manning and equipment requirements that are fixed. These 5 multifunctional support brigades
7 include:

8
9 **Fires Brigades.** The fires brigade uses mounted and towed artillery to provide close support
10 and precision strikes. The Brigade employs artillery within the unit but also can control and
11 direct the fires of other armed forces or coalition partners. A Fires Brigade with high mobility
12 artillery rocket system and 1.55 howitzers consists of approximately 1600 Soldiers, their
13 vehicles, and equipment.

14
15 **Aviation Brigades.** There are several types of aviation brigades, each with a different function.
16 Aviation Brigades include Combat Aviation Brigades, Medium, and Heavy lift aviation Brigades
17 and multi-functional aviation brigades. Aviation Brigades typically consist of 80 - 100 helicopters
18 and approximately 2,000 to 3,000 Soldiers.

19
20 **Battlefield Surveillance Brigades (BfSB).** The BfSB provides reconnaissance, surveillance,
21 target acquisition, and intelligence support to the Army's combat units. The BfSB builds a
22 common operational picture across Army and other joint or allied units to focus the efforts and
23 facilitate mission accomplishment.

24
25 **Maneuver Enhancement Brigades (MEB).** The MEB enables, enhances, and provides
26 freedom of maneuver and engineering support to an Army, joint, or multinational headquarters.
27 The MEB augments maneuver and support brigades with functional assets to provide combat
28 maneuverability and focused logistics across multiple areas of operation and can provide a
29 headquarters to command and control an assigned area of operations including maneuver
30 forces. An MEB headquarters unit consists of approximately 570 Soldiers.

31
32 **Sustainment Brigades.** The Sustainment Brigade consists of a modular headquarters unit of
33 approximately 350 Soldiers and light, medium, and heavy tactical trucks. The primary mission of
34 the unit is to provide a complete range of logistics support supplies and services to combat
35 BCTs and supporting Brigades. Often this support is in the form of fuel, ammunition, parts,
36 food, and contracting services, to highlight just a few of the many logistical requirements of the
37 BCT.

38
39 Each of these Brigades is augmented by different military skill sets, for example, military
40 intelligence, communications, command and control, or explosives ordnance. Each of these
41 skill sets are combined in a precise manner within a BCT or support unit to provide the right skill
42 sets to meet national security and defense requirements.

43
44 **Combat Support Units.** In addition to BCTs and support brigades, the Army also consists of
45 units at various echelons that provide a variety of combat support functions. Combat Support
46 Units consist of Engineer, Military Police (MP), Chemical defense, and Explosive Ordnance
47 Disposal (EOD) brigades, battalions, companies, and attachments. Engineer units provide
48 horizontal (such as roads and other surfaces) and vertical (structures) construction project
49 planning and execution. The units are equipped with light, medium, and heavy tactical trucks
50 and various types of earth moving equipment (ex. bulldozers and road graders). Military police
51 units provide tactical reconnaissance and movement control, law enforcement, and enemy

1 prisoner of war control. The units are equipped primarily with light trucks and several medium
2 trucks. Chemical units provide chemical warfare detection capability and capabilities to
3 decontaminate Army Soldiers and equipment if they are attacked by enemy chemical munitions.
4 EOD units identify, disarm, and destroy explosives and explosive devices. The units are
5 equipped with light and medium tactical trucks. Most combat support units range in size from
6 50 to 600 Soldiers.

7
8 ***Changes to Combat Support Units as Part of Army Modularity.*** Several changes to combat
9 support units are being implemented across the Army to improve operations and fill critical
10 capability gaps. Changes needed to implement Army modularity to support operations in the
11 Pacific theater are listed below.

12 13 **Modularity-based Force Structure Changes to Engineer Units:**

14
15 Engineer units are being added across the Army to provide additional construction, combat and
16 engineering support capabilities. Engineer companies allow the Army to build roads and
17 support Army logistical and sustainment functions. Army engineers also construct key
18 deployment infrastructure to include temporary air-fields. Combat engineers have been added
19 to the Army's force structure as part of modularity to assist in route clearance, demolitions and
20 other missions. Special engineering functions, such as power supply units, have been
21 consolidated and reorganized for greater efficiency. Engineering functions have been identified
22 as shortfalls across the Army.

23 24 **Modularity-based Force Structure Changes to Military Police Units:**

25
26 In 2007, the Army approved a clustered stationing concept for MP combat support companies
27 and battalions. Under this concept, MP companies will be stationed near each other. This will
28 make it possible for them to provide continuous support to Army mission requirements while
29 also supporting local law enforcement. Under the cluster concept, there would always be an
30 MP company to provide local law enforcement support while other MP units are deployed.

31 32 **Modularity-based Force Structure Changes to Explosive Ordnance Units:**

33
34 As part of Army modularity, the Army is increasing personnel in EOD units to a total strength of
35 44 Soldiers. This increase is needed to address emerging threats the Army is encountering
36 related to the use of improvised explosive devices. EOD units are needed to address critical
37 capabilities shortfalls across the Army.

38 39 **Modularity-based Force Structure Changes to Chemical Units:**

40
41 Chemical companies Army-wide are receiving from 2-6 additional personnel as part of modular
42 force adjustments. These adjustments address critical capabilities shortfalls in chemical,
43 biological, radiological, nuclear, and high yield explosive defense.

44 45 **Modularity-based Force Structure Changes to Unmanned Aerial Surveillance Units:**

46
47 The Army is stationing additional Unmanned Aerial Surveillance (UAS) units to support the
48 operations of its BCTs. This 126 person unit operates unmanned aerial surveillance aircraft.
49 These units provide Army BCTs with additional capability to conduct reconnaissance and
50 surveillance missions. UAS units allow the Army to conduct reconnaissance missions in order
51 to provide intelligence and early warning of enemy intent. These units have been identified as a

critical shortfall across the Army. UAS units can be used to augment BCT capabilities or support theater operations as required.

Combat Service Support Units. Combat Service Support Units consist of transportation, maintenance, and quartermaster battalions, companies, and other attachments that provide storage, control, distribution and repair/maintenance of general military supplies and equipment. Surface transport of supplies and equipment and other logistics functions provided by these units is typically accomplished using light, medium and heavy tactical trucks. Most Combat Service Support units range in size from 50 to 600 Soldiers.

Changes to Combat Service Support Units as Part of Army Modularity. Several changes to Combat Service Support units are also being implemented across the Army to improve transportation, logistics, and medical operations and fill critical capability gaps. Changes needed to implement Army modularity to support PACOM operations are listed below.

Modularity-based Force Structure Changes to Theater Logistics Support:

Theater Sustainment Command: As part of Army modularity, every Theater Army Headquarters will include a Theater Sustainment Command (TSC) (*The Modular Force* FMI 3-0.1). The TSC is the Theater's single senior logistical command. As a part of modularity, the TSC consists of 154 active component Soldiers.

Transitional Theater Opening Element: Each TSC is accompanied by a Transitional Theater Opening element. The mission of this unit is to support theater contingency operations by establishing link-up with the Theater headquarters sustainment command to improve logistics delivery and sustainment capability while supporting contingency operations. The Transitional Theater Opening element consists of 54 Soldiers.

Theater District Element: The Theater District Element is a modular Theater level augmentation needed to support and command and control theater logistics/sustainment brigades.

Signal Command (Theater): Theater signal forces have undergone considerable restructuring as part of Army modularity. Each theater is allocated a signal command which includes a theater network capability module (TNC-M). The theater's Signal Command is the senior signal organization in theater and is responsible for enabling combatant commander and theater communications.

Movement Control Teams: Theater transportation assets have been upgraded as a part of Army modularity to include movement control teams. These teams assist in the execution of deployment and post-deployment logistics operations.

Forward Surgical Teams: As part of modularity, the Army has increased the number of surgical specialists that are available to deploy to support theater operations. 6 Soldiers have been included as an upgrade to the Army's surgical capabilities to support Theater deployments.

Warrior in Transition Units: In June 2007, the Army made decisions to make modular improvements to its casualty assistance programs. The Army's programs are designed to assist Soldiers by providing support services to severely disabled Soldiers and their Families. The Warrior in Transition program attends to the needs of Soldiers who requires medical treatment

1 and evaluation. The program includes Soldiers with complex medical needs requiring six
2 months or more of treatment. Medical and administrative staffing for the Warrior in Transition
3 program requires 164 Soldiers.

4 ***Modular Changes to Brigade Combat Teams.***

5
6
7 **Drivers and Augmentees to IBCTs:** As part of Army-wide modularity adjustments new
8 positions were added to Army BCTs. For example, each BCT is now authorized a Deputy
9 Commander. Through Grow the Army we were able to assign a dedicated driver to the Deputy
10 Commander. This allows the Deputy Commander to assist the BCT Commander in exercising
11 command and control of the subordinate units of the BCT. In addition IBCT modularity
12 adjustments include military intelligence company personnel to provide additional analysis and
13 integration, MP gunners, and Battalion S2 staff enhancements. These modular adjustments to
14 Army IBCTs total 16 additional personnel per IBCT across the Army.

15
16 **Drivers and Augmentees to SBCTs:** SBCTs across the Army receive a total of 82 additional
17 personnel. These consist of a Deputy Commander and driver, 24 personnel for Headquarters
18 enhancement, a 42-person MP platoon, and a 14-person computer automation cell.

19
20 SBCTs also are receiving a 103 person maintenance unit. When the SBCT was originally
21 fielded maintenance for the vehicles were provided by contracted labor. As part of modular
22 force decisions these maintenance functions will now be provided by Soldiers organic to the
23 SBCT. This ensures the SBCT is able to deploy overseas with the necessary maintenance
24 personnel.

25 26 **1.2.2.6 Power Projection and Strategic Deployment within the Pacific Rim**

27
28 The United States is a nation with key national security interests in the Pacific. The policies put
29 forth in the NSS, NDS, QDR, and ACP provide directives and explicit guidance for the Army to
30 improve its capacity to project power rapidly to prevent, deter, or defeat the actions of those who
31 would do the nation harm while maintaining stability across the Pacific Rim. Effective
32 deterrence requires that U.S. defense forces can credibly act to halt those activities that
33 threaten U.S. national security. Rapid power projection to respond to the wide range of
34 potential contingencies present in an increasingly complex global security environment is a
35 foundational capability needed to support national security. The Army remains committed to its
36 strategic goals of having the capability to deploy its forces anywhere in the Pacific theater within
37 a few days of notification. This requires advance planning to respond to contingencies and
38 detailed planning based on deployment facilities availability, logistics, and available
39 transportation. PACOM force requirements are driven by its requirements to support the NSS
40 and NDS. These requirements guide the Army in selecting stationing locations that can support
41 PACOM operations.

42
43 As an active operational theater with ongoing active and contingency missions, the stationing of
44 units supporting the requirements of PACOM must be conducted with an added emphasis on
45 strategic deployment requirements. Units within PACOM are often on-call to respond to specific
46 missions. These missions require that the proper numbers and types of units are collocated
47 with the right transportation assets and deployment facilities to respond effectively to
48 contingencies in the Pacific Rim.

49 50 **1.2.3 Sustaining Force Readiness**

1 The Army has always focused on maintaining an operationally ready force that can respond to
2 emerging threats and potential contingencies that threaten national security. Maintaining
3 operational readiness means providing Soldiers and leaders with dedicated time to train and
4 rehearse on core mission essential tasks, fully employ the capabilities of their equipment in a
5 training environment, and maintain their vehicles, weapons, and other essential combat
6 systems. The Army plan includes a readiness model to manage the force and ensure the ability
7 to support demands for Army forces. This Army readiness model follows a process for Army
8 Force Generation (ARFORGEN). The ARFORGEN process ensures that individual units
9 receive adequate time to prepare for deployment through training and maintenance activities
10 and that manning, equipping and resourcing can be synchronized with unit deployments. The
11 ARFORGEN force readiness model brings units to a full state of readiness in terms of manning,
12 equipment and training before they are scheduled to deploy. The ARFORGEN process is
13 designed to reduce Soldier uncertainty with regards to deployments and provide combatant
14 commanders of the U.S. Army with a consistent level of ready forces to execute operations
15 abroad. In providing Commander's with "ready" trained, manned and equipped units the
16 ARFORGEN model assumes that active duty units will support one operational deployment in a
17 three year period. Reserve Forces would be anticipated to support one deployment every five
18 to six years.

19
20 The ARFORGEN process which was implemented across the Army in February of 2006
21 categorizes Army units in three readiness states as depicted in Figure 1.2-1. These readiness
22 states are:

- 23 • **Reset/Retrain:** Units recover from their previous deployment, reconstitute,
24 repair and replace equipment and assign and train new personnel as required.
25
- 26 • **Ready:** Units conduct mission preparation and rehearse more complex, higher
27 level group training tasks involving greater levels of planning and coordination.
28 Units rehearse with other operational Headquarters for potential upcoming
29 missions. These units are eligible to fill operational surge requirements, if
30 necessary.
31
- 32 • **Available/Deployed:** Units in the available category of the ARFORGEN process
33 are used as necessary to support operational and contingency requirements.

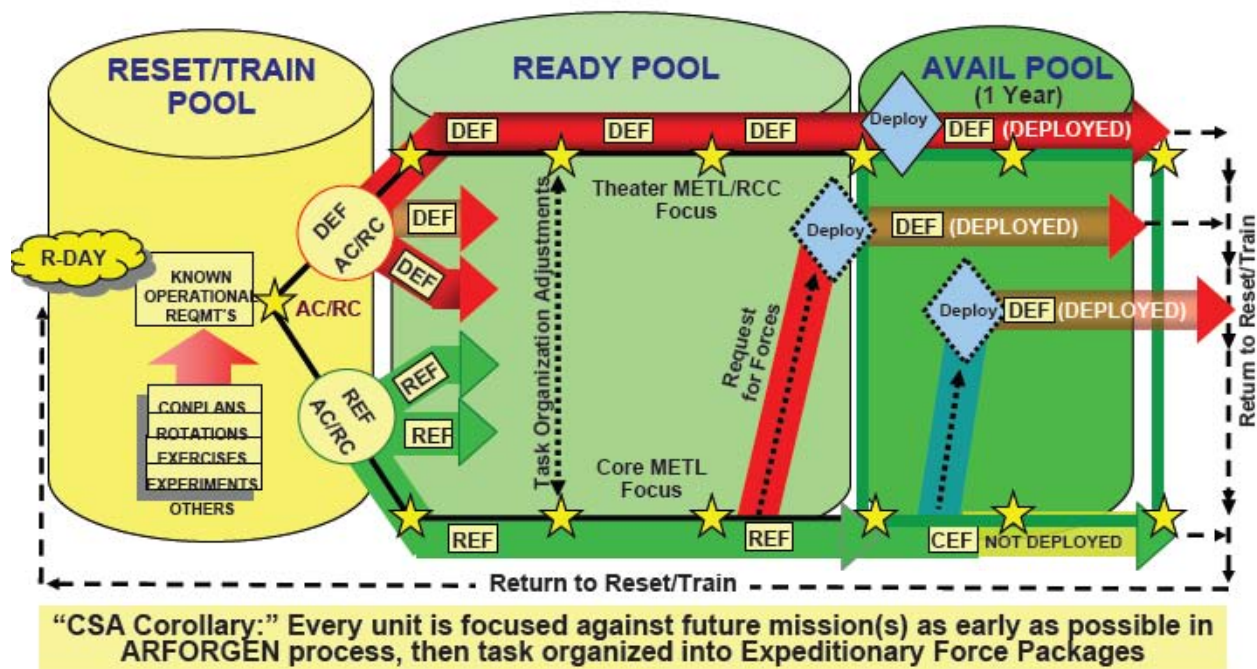


Figure 1.2-1. ARFORGEN Process

On-going missions and evolving threats from state and non-state sponsored sources of terrorism have markedly increased demand for ready and available Army forces to participate in the full spectrum of combat and peace support operations. Since 2003, the Army has been unable to implement optimal deployment cycling for Active or Reserve component Soldiers across the Pacific Theater. Reserve component forces have also been spending more time deployed than maintaining readiness as prescribed by the ARFORGEN process.

To provide forces needed for global operations in the US Central Command (CENTCOM), PACOM and the US Army Pacific (USARPAC) have been forced to shorten timeframes for preparation and readiness activities. This compression of ARFORGEN cycling has allowed PACOM to meet near-term force requirements but has carried forward institutional risk as the Army continues to conduct global operations at an accelerated pace. The continued compression of ARFORGEN cycles can lead to a degradation of force readiness if the high operations tempo and increased frequency of deployment continues across multiple deployment cycles. USARPAC does not currently have the requisite number of troops to implement optimal deployment cycling as prescribed by ARFORGEN. In addition, there is currently a shortfall of the number and types of troops on-hand to respond to regional security and contingency missions of the Pacific. In February 2007, the Army revised deployment policies to compress further ARFORGEN cycling to meet surge requirements of Operation Iraqi Freedom. Current deployment policies allow for 15 months of deployment time with 12 months at home station to conduct readiness activities. These deployment policies remain in effect, though they are currently under review by the Secretary of Defense and senior Army leadership.

1.2.4 Preserving Soldier and Family Quality of Life

1 Preserving Soldier and Family quality of life and the all-volunteer force are two of the Army's
2 highest priorities and concepts that are inseparably linked. The Army strives to maintain the
3 highest possible quality of life for those who serve by establishing deployment predictability and
4 balancing the timeframes for which Soldiers are deployed away from home station against
5 mission requirements.

6
7 Meeting the stationing needs of Army units means ensuring that the Soldiers and their Family
8 members have access to quality schools, medical facilities, housing, services, and ample
9 access to recreation opportunities. In a typical Army unit, approximately 50-55% of Soldiers are
10 married. A 4,000 person Brigade for example, may be accompanied by more than 2000
11 spouses and 1500 children. Army installations are used not only for military training, but are
12 also the communities in which Families live. The Army is absolutely committed to providing the
13 highest quality of life that can be attained for the Soldiers and their Families who have endured
14 multiple deployments supporting the wars in Iraq and Afghanistan. Stationing locations
15 considered for the stationing of new units must have or be able to build housing and living
16 space, schools, medical facilities, and support the recreational opportunities for the Soldiers and
17 Families of the new Army units.

18 19 **Unit Level Requirements**

20 21 **1.2.5 Training Infrastructure**

22
23 The mission of Army units is ultimately to support the full spectrum of potential operations from
24 waging the nation's wars to supporting peace and stability. While at home station, it is critical
25 that Army units retain or develop those skills necessary to deploy and execute their mission.
26 Effective training, carried out to a high doctrinal standard, is the cornerstone of operational
27 success. High quality training, which prepares Soldiers for what will be encountered in the
28 operational environment, is essential to ensuring the success of the nation's strategic defense
29 objectives, national security, and the safety of those who serve.

30
31 A critical element of need for the Proposed Action is the selection of stationing locations where
32 units can attain high levels of training proficiency to prepare for deployment. Training and
33 qualifying Soldiers and units typically requires three types of training facilities in the field:
34 individual and crew served weapons qualification ranges, live-fire range complexes that allow
35 units to conduct live-fire training simultaneously as one team, and maneuver areas for units to
36 rehearse and train on the full complement of mission essential tasks required by a units' training
37 doctrine. In addition to live training, the Army also augments its leader development and unit
38 training strategies with virtual and battle simulations. Army units must be prepared to execute a
39 full array of combat, stability, and peace support operations.

40
41 The level of combat readiness of Army units is directly related to the availability and capability of
42 its supporting training infrastructure. As part of Army transformation, the Army has undergone a
43 radical process to modernize and transform its training ranges to replicate operational
44 conditions more closely. Unit range requirements and standard designs are described in Army
45 Training Circular 25-8 *Army Training Ranges*, which serves as the definitive source document
46 for Army training range requirements. Locations selected for the stationing of new Army units
47 must accommodate the construction of range requirements for the unit so that the unit can
48 adequately train to meet doctrinal training readiness standards.

49
50 In addition to adequate firing ranges Army units require access to maneuver space to conduct
51 collective, or group training and exercise their equipment in an integrated fashion. Units must

be able to execute a full range of combat and peace support operations to ensure mission success. At all levels, units must have adequate maneuver training land to conduct and rehearse training operations to certify themselves as a deployable unit. Army Training Circular 25-1 *Training Land* serves as the definitive source document for requirements for maneuver land training.

1.2.6 Readiness / Garrison Operations Facilities

When at home station, Soldiers require adequate garrison facilities to conduct routine operations and maintenance in order to sustain their equipment. Garrison operations ensure the unit is administratively prepared and functionally equipped to support deployment operations. Stationing of an Army unit requires dedicated administrative office space for its Soldiers, motor pools, vehicle maintenance facilities, weapons armories, and many other administrative facilities to ensure operational readiness. The Army Corps of Engineers (USACE) has designed and implemented a program of standard facilities that are required to support Army modular forces. Stationing sites selected for the stationing of new units must be able to accommodate new unit garrison operations through existing facilities or the construction of additional support facilities. Given that there are a minimum of vacant facilities available across PACOM installations, and indeed the Army, most actions will require the construction of new facilities.

1.2.7 Summary of Need

The Army's need for growth, transformation and realignment to support Pacific theater operations and other commitments is multi-faceted. The need for action stems from the need to support increased national and regional security and defense mission requirements, the continuing need to adjust force structure as part of Army transformation, the need to sustain force readiness, and the need to preserve Soldier and Family quality of life. The Proposed Action will address those issues being faced by the Army as it continues to meet national security and defense requirements now and in the future.

1.3 Purpose of the Proposed Action

The purpose of the Proposed Action is to ensure that Army forces of the appropriate sustainable size are available to support operations of PACOM and other Army commitments and are capable of meeting the current and future projected demands and requirements of national security and defense in the region and elsewhere in the world. Implementing the Proposed Action will enable USARPAC to achieve a sustainable balance between global and regional mission requirements and force readiness levels, continue to implement Army transformation and modularity, improve home station readiness preparation, and maintain a high Soldier and Family quality of life.

1.4 Ongoing Army Initiatives (BRAC, Modularity and GDPR)

Initiatives to grow and realign the forces to support Pacific theater and worldwide operations must be considered in the context of several major on-going Transformation and stationing initiatives. These initiatives include Army modular Transformation to standardized unit organizations and those moves directed by the BRAC Commission recommendations and GDPR. Each of these initiatives is discussed in greater detail below.

1.4.1 BRAC 2005

1 The BRAC 2005 realignment and closures were designed to provide the necessary
2 infrastructure to support Army Transformation, including GDPR, the ACP, and conversion to a
3 modular force structure. Through the current 2005 BRAC actions, the Army is transitioning from
4 a force capable of countering Cold War-era threats to one that is responsive to a broad range of
5 contingency threats that represent a range of security threats facing the nation today.

6
7 BRAC is inextricably tied to Transformation and Army growth, affecting 74 Army installations by
8 directing the closure of 13 active facilities, the realignment of 53 active facilities, and the closure
9 of 211 National Guard and 176 Reserve facilities. BRAC 2005 actions serve as the baseline for
10 which Army growth and restructure stationing decisions will be determined. Objectives of BRAC
11 include optimizing military value, advancing the Army Modular Force (AMF) conversion,
12 accommodating the re-stationing of overseas units, enabling the Transformation of both the
13 active and reserve components, adjusting the force structure, and furthering the Army's ability to
14 conduct joint operations. Congress directed the closure of specific Army installations and also
15 directed the realignment of Army units from one home installation to another. The Army staff
16 and Secretariat have a mandatory duty to implement these actions and they are thus
17 considered part of the existing baseline.

18 19 **1.4.2 Global Defense Posture Realignment**

20
21 The U.S.'s global defense posture is characterized by the size, locations, types, and roles of
22 forward military forces. Transformation and the QDR directives provide guidance to restructure
23 the military for rapid deployment from within the U.S. while reducing the presence and reliance
24 of U.S. forces on foreign nations. As part of the overall Transformation effort, the Army is in the
25 process of relocating 44,500 Soldiers to its U.S. installations between 2004 and 2011 and
26 downsizing the number and footprint of facilities on non-US soil to support the expeditionary
27 vision contained within the QDR. Past GDPR actions are considered part of the existing
28 baseline condition for analysis.

29 30 **1.4.3 Army Modular Force (AMF)**

31
32 As discussed in Section 1.2.2.5, Army modularity is a critical element of Army force structure
33 that allows the Army to quickly and effectively adapt its forces to respond to emergent threats
34 and contemporary operating conditions. Army modularity is a dynamic Army-wide process that
35 continually assesses and makes adjustments to Army force requirements.

36 37 **1.5 Scope of the Analysis**

38
39 This SPEIS has been developed in accordance with NEPA, the regulations issued by the
40 Council on Environmental Quality (CEQ) CFR Parts 1505 – 1508 and the Army's implementing
41 procedures published in Title 32 CFR Part 651, *Environmental Analysis of Army Actions*. The
42 SPEIS addresses the proposed growth and adjustment of the composition and stationing of
43 Army forces to support operations in the Pacific Theater of Operations. As part of the Proposed
44 Action, Army forces may be stationed at installations in Pacific Theater or at locations in the
45 continental United States. The SPEIS will provide the decision-maker important information
46 regarding environmental impacts associated with the proposed action and alternatives before he
47 makes a final stationing decision. The scope of the SPEIS will encompass activities to support
48 Army Growth and the ACP projected to take place from 2008 through 2013. This document
49 incorporates and supplements analysis from the Final Programmatic EIS for Army Growth and
50 Force Structure realignment (2007). Information from that document may be used by the
51 decision-maker to support decisions to station units at any of the seventeen installations the

Army examined in 2007 to support decisions made to implement the Proposed Action. As conditions change this document may be supplemented.

This analysis does not include BRAC realignments and closures, which are part of the baseline for the analysis. This analysis includes the evaluation of installations capable of supporting operations in the Pacific Theater and incorporates the Army's Programmatic Environmental Impact Statement for Army Growth and Force Structure Realignment (January, 2008) by reference. Installation locations carried forward for analysis in this SPEIS are those sites that may receive more than 1,000 new Soldiers from 2008 through 2013 as part of the initiatives discussed above. The 1,000-Soldier threshold was chosen because it represents a level of growth at a majority of installations at which significant impacts could occur and should be considered at the programmatic level. Additional installation-specific analysis will be conducted as necessary and, if appropriate, may use analysis included in this SPEIS.

This analysis does not include analysis of the stationing of new BCTs. Recently, as part of decisions related to Army growth and force structure realignment (Record of Decision, 2008) the Army made decisions to grow by 6 BCTs and station 2 existing BCTs in locations within CONUS. The Army does not feel that it needs additional BCTs stationed in locations capable of supporting operations in the Pacific Theater at this time. Additional BCT stationing actions are not considered in this document as part of alternatives considered.

This SPEIS assesses the environmental capacity of Army installations and their ability to accommodate additional stationing of units to support operations in the Pacific Theater. This SPEIS conducts a broad programmatic analysis to examine environmental and socioeconomic impacts, and is intended to inform senior Army Leadership. It does not serve as the NEPA documentation to support local installation-level actions. As the programmatic decision made at the Army Headquarters-level is implemented, follow-on NEPA documentation may be prepared to evaluate the specific environmental impacts likely to result from alternative means of carrying out the stationing actions, as well as identify any potential means for mitigating those impacts associated with the stationing decision.

Broad spectrum modeling has been conducted to determine the initial environmental and socioeconomic areas of concern, as well as the general capacity and conditions of the proposed installations. The comparison of training activities, current environmental and socioeconomic climates, and proposed stationing activities will provide decision-maker with the appropriate tools and information to make an informed decision.

This analysis examines installations within their current boundaries. It does not consider possible expansion of land holdings. There are no installation expansion actions that are included in the scope of this analysis for the growth, realignment, and transformation of units required to support operations in the Pacific Theater.

The scope of the affected environment will include a geographically designated area presented in Table 1.5-1.

Table 1.5-1. Geographic Scope of Valued Environmental Components (VEC)

VEC	Geographic Scope of Resource
Air Quality	Metropolitan area, air shed, global atmosphere
Air Space	Metropolitan area
Cultural	Historic properties or districts/prehistoric areas

VEC	Geographic Scope of Resource
Noise	Metropolitan area
Soil Erosion	Cantonment and range areas
Biological Resources	Habitat, ecosystem; including migratory birds – breeding grounds, wintering areas, migratory routes, total range Threatened and Endangered Species (T&E) Species and Vegetation
Wetlands	Watershed-based area
Water Resources	Streams, river basin, estuaries; watershed-based
Socioeconomics	Community, metropolitan area, county or state (U.S. Census)
Energy	Community, county, region, or state
Land Use	Community, county, region, or state
Hazardous Waste	Metropolitan area
Traffic and Transportation	Metropolitan area, county, or region
Facilities	Metropolitan area

Proposed impacts and cumulative effects are documented in the SPEIS. Where applicable detailed follow-on analyses will occur at the site-specific installation level as needed to implement actions associated with Army growth and realignment. These additional analyses would be conducted in accordance with 32 CFR Part 651 (*Environmental Analysis of Army Actions*).

The analysis of impacts as presented in this SPEIS is broken down into four major activity groups which define the categories of action needed to support installation level stationing actions. These activity groups are:

- **Garrison Construction.** This activity group involves all types of construction activities including construction and/or modification of buildings and garrison infrastructure. The construction activity group includes new construction, repair and maintenance of existing facilities, and demolition of buildings and facilities.
- **Training Infrastructure Construction.** This activity group involves training infrastructure construction activities needed to support unit training activities. This includes construction of firing ranges, simulations facilities, and training support infrastructure. The training infrastructure construction activity group includes new construction, repair and maintenance of existing facilities, and demolition of buildings and facilities.
- **Live-Fire Training.** This activity group involves achieving and maintaining readiness to perform assigned missions through weapons qualification and coordinated live-fire activities. Live-fire tasks include the use of live ammunition, blanks, and training ammunition to simulate a realistic training environment. Army doctrine for individual and collective (unit) training is based on mission-essential task lists. These lists identify all types of training activities that are need by individuals and units to be ready to perform their missions.
- **Maneuver Training.** Units conduct maneuver training in accordance with Army doctrine for individual and collective (unit) training based on mission-essential task lists. Maneuver training allows units to effectively coordinate and integrate force capabilities in a simulated operational environment. This activity group includes the management of millions of maneuver acres in the Army's inventory.

1 Stationing and growth decisions would occur through various actions, any of which, depending
2 on the circumstances, could result in adverse effects to the environment.

3
4 The programmatic approach is designed to allow for early planning, coordination and flexibility
5 throughout the implementation of Army growth and force restructuring. The SPEIS lays the
6 foundation for subsequent analyses and decision making and is designed to leverage multi-year
7 analyses to assist in making stationing decisions. Additional installation-specific analyses will
8 be conducted and will use, as appropriate, analysis included in this SPEIS. At the site-specific
9 level, analysis will be conducted to address changes and environmental effects of implementing
10 stationing.

11 1.6 Public Involvement

12
13
14 Under NEPA, the public is afforded the opportunity to participate in the process at various
15 stages of the project. Public participation provides open communication between the Army and
16 interested parties, ultimately resulting in better decision-making. Through CEQ (40 CFR Parts
17 1500-1508) and Army regulations (32 CFR Part 651), the Army has and will provide the
18 following notifications and opportunities for involvement by the public:

- 19
20 • Notice of Intent (NOI) to prepare a SPEIS, Published in the Federal Register (*FR*) on March
21 13, announced the Army's intent to prepare this SPEIS and desire to receive public
22 comment. In addition, the NOI was published in multiple local newspapers in locations
23 throughout the Pacific Theater.
- 24 • Public scoping comments were received from 13 March through 16 April; Public scoping
25 comments were considered in the formulation of this draft SPEIS.
- 26 • The draft SPEIS will be placed on a publicly accessible website (www.aec.army.mil) and will
27 be placed at publicly accessible locations in areas surrounding installations affected by the
28 implementation of Army Alternatives
- 29 • Announcement of availability of the draft SPEIS will be published in the Federal Register
30 and announced in local papers of installations affected by the implementation of Army
31 alternatives
- 32 • The public will have 45 days to submit comments on the SPEIS when it is published in the
33 Federal Register

34
35 The Army received scoping comments from the public expressing concern over a number of
36 issues that the public has concerns about or would like more information with regards to this
37 Supplemental EIS process. The major concerns and issues expressed during the scoping
38 process that were determined to be within the scope of this EIS are as follows:

- 39
40 • The State of Hawai'i Department of Education is concerned about increases in
41 student populations related to implementation of the Proposed Action and would
42 like to review the Draft SPEIS
- 43
44 • Concerns over available facilities and lack of space in Hawai'i
- 45
46 • Impacts to additional traffic and congestion in Hawai'i and increased noise
- 47
48 • The Aircraft Owners and Pilots Association (AOPA) requests that the SPEIS
49 include discussion of airspace and airspace impacts. AOPA requests that a
50 similar rating methodology to the PEIS be used in the Supplement to the PEIS
51 when determining Airspace impacts

- AOPA requests that any installation requiring additional Special Use Airspace (SUA) be dropped from further consideration
- Economic and social impacts to Hawai'i from additional stationing of Soldiers and dependents
- Impacts to cultural resources in Hawai'i
- Impacts to natural resources in Hawai'i and increased detrimental impacts to Hawai'i's threatened and endangered species
- Contamination of soil, air, water; depleted uranium issues
- Need to assess cumulative impacts at all sites that may be affected by Army stationing
- Need to ensure that this action is considered along with the considerable number of on-going military projects in Hawai'i to include growth of the US Marine Corps at Kane'ohe Bay.
- Changes in Land Use as a result of implementation of the Proposed Action

The comments and concerns of the public and agencies were used to determine the focus of analysis. A summary of scoping comments received during the scoping process is included in the project record.

1.7 Army Decision Making Process

The Army's decision-maker will consider the environmental and public issues of concern disclosed in this SPEIS. In addition, he will consider several non-environmental factors critical to a final force structure decision as discussed below. After thoroughly evaluating this information, the decision-maker will document the decision, selecting one of the proposed action alternatives in a Record of Decision (ROD), which will be signed no earlier than 30 days from the publication of the Notice of Availability of the Final SPEIS. The ROD will clearly and definitively articulate the decision made and provide a supporting explanation. It will explain both the significant factors he relied on in making a final decision and why the final alternative best meets the purpose and need. He will acknowledge the comparative environmental impacts and benefits resulting from his decision particularly if the alternative selected is not the environmentally preferred alternative. The ROD will be made available to the public when it is finalized.

1.7.1 Decision to be Made

After completing a deliberative and thorough decision making process the Army will sign a Record of Decision (ROD), selecting for implementation one of the three action alternatives described in Section 3.0 or the no action alternative. The Army decision-maker may decide to select a combination of alternatives presented in this document to meet USARPAC's force structure needs. It is important to understand that the decision-maker has limited flexibility in choosing a stationing location under Alternative 1 and to a lesser extent Alternative 2. These alternatives involve the continued implementation of Army-wide modularity and force

management programs at the Theater level and below. Under Alternative 1 and 2, existing units are being augmented with additional Soldiers or Army-wide decisions have been made require designated support units to be collocated with existing units where they are currently stationed.

The Army does have flexibility and discretion to station multi-functional support brigades as part of decisions to be made. These stationing decisions are not contingent on previous unit stationing actions. Multi-functional support brigades are requested by the Theater Command to support capabilities shortfalls and theater mission requirements. The Headquarters, Department of the Army (HQDA) decision-maker may chose to station additional multi-functional support brigades at the 4 installations evaluated in this document, or may chose to station these units at any of the 17 major training installations evaluated in the Final PEIS for Army Growth and Force Structure Realignment (October, 2007). The decision-maker has some discretion to evaluate Army-wide mission requirements and the factors presented in this EIS and to chose the number, type, and final stationing location for multi-functional support brigades needed to support PACOM mission requirements. As previously discussed, the decision-maker is not considering the stationing of additional BCTs to support PACOM operations at this time. Additional BCT stationing actions are not considered in this document and are not part of decisions to be made through this decision-making process.

Senior Army leadership will take several factors into account when making the final force structure and stationing decision. The SPEIS provides information on significant environmental impacts and issues of public concern regarding the physical and natural environment. In addition, the Army decision-maker will give consideration to non-environmental factors including existing and emerging national defense needs; global security situations; the mission needs of Combatant Commanders; the professional judgment of senior military leaders; the capacity of installations to support additional units; and, the quality of life of Soldiers and their Families. These factors are captured in the description of need and purpose for the Proposed Action (Chapter 1.0) and the description of the Proposed Action (Chapter 2.0)

Methodology to Support Supplemental Programmatic Decision

It is important to understand the relationship in the decision making process among the three action alternatives and scenarios analyzed within the SPEIS. The Army developed a full range of reasonable alternatives for consideration, comparison, and evaluation that is consistent with NEPA, the regulations published by the Council of Environmental Quality, and the Army's implementing NEPA procedures (Title 32 CFR Part 651). The Army considered the alternative to be reasonable if it was capable of meeting the Purpose and Need for the Proposed Action to configure and station the force to meet defense and national security requirements. This SPEIS broadly states the purpose for stationing units to support PACOM operations and explains how the Army developed the three distinct alternatives. The three action alternatives will provide the decision-maker with courses of action that would result in different stationing scenarios at installations capable of supporting operations in the Pacific Theater.

The SPEIS evaluates five different potential stationing scenarios for each location evaluated in the document. Each of these scenarios is designed to evaluate the environmental capacity of an installation and its ability to accommodate potential stationing actions (anywhere from 1,000 to 3,000 additional Soldiers) to support the Proposed Action. Each of the Alternatives evaluated in the SPEIS provides the unit stationing actions that may occur in order to implement the alternative. The units discussed within the Alternatives section approximately correspond with one of the installation stationing scenarios evaluated in this SPEIS or the PEIS for Army Growth and Force Structure Realignment which is incorporated by reference. The decision-maker will

1 be able to compare environmental impacts for implementing alternatives when comparing the
2 stationing actions of the alternative to the stationing scenario that it most closely approximates.
3

4 The Army units considered in this SPEIS have unique requirements for live-fire ranges;
5 maneuver land, equipment, and vehicle maintenance facilities; Family housing, support
6 facilities, and deployment requirements. This SPEIS compares the locations to determine which
7 locations best meet these requirements. Section 4 of this SPEIS identifies the primary activities
8 that will be taken by the Army to support the proposed action. These include: facilities
9 construction and use; range construction; maneuver training; and live-fire training. It also
10 identifies the Valued Environmental Components (VECs) at these locations and predicts the
11 probable intensity of environmental impact to each VEC at the particular installation.
12

13 Using this approach the decision-maker can compare and contrast the differing environmental
14 impacts associated with selecting the different types and sizes of units for stationing to support
15 Pacific theater operations at installations in the Pacific (in this document) and at CONUS
16 locations (in the PEIS). When the decision-maker makes his final choice on the right force
17 structure he will be fully informed on the environmental consequences likely to result from his
18 decision. As the units are stationed at locations identified in the ROD, the Army may prepare
19 additional NEPA documentation to consider the detailed site-specific impacts.
20

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 Introduction

This chapter provides a description of the Proposed Action and those supporting actions the Army would undertake to implement the Proposed Action. The Proposed Action addresses the need to grow and realign the Army better to support the operations of the Pacific Command (PACOM). The Pacific Theater area of responsibility includes areas throughout the Pacific Rim, Eastern Asia, and Australia. To implement the Proposed Action the Army would add a variety of new units and realign existing units to enhance the configuration of its available forces to support PACOM operations and implement Army modular forces decisions. The units considered for stationing as part of the Proposed Action include Combat Support (CS) and Combat Service Support (CSS) units and multi-functional support brigades. Four primary activities are required to support unit stationing. These activities include garrison construction, training infrastructure construction, live-fire training, and maneuver training. This chapter describes the Proposed Action and site-specific activities that would be associated with unit stationing actions.

2.2 Proposed Action

The Proposed Action is to increase the Army's end-strength and realign the Army's force structure from 2008 through 2013 to a size and composition that will meet Pacific Theater security and defense requirements; structure the force in accordance with Army Transformation and modularity; sustain unit equipment and training readiness; and preserve Soldier and Family quality of life. To fully implement the Proposed Action, units must be stationed at locations that are able to accommodate unit training, garrison and maintenance activities, and preserve Soldier and Family quality of life. In addition, final stationing locations must be able to support the strategic deployment and mobilization requirements of the Pacific Command in support of regional defense and security objectives.

The Proposed Action involves the stationing of units in a manner that supports the Army Campaign Plan (ACP), Army modularity, and global and theater force requirements. The SPEIS will address the environmental and socioeconomic effects of the proposed activities beginning in 2008 and extending through 2013.

2.3 Actions Required to Implement the Proposed Action

Alternatives to grow the Army will ultimately involve four activities that must be integrated and synchronized by the Army to support new unit stationing actions and realignments. The activities are separated out in this section and discussed in detail to facilitate an understanding of the primary activities that are projected to result in effects to the human environment and lead to direct, indirect, and cumulative effects. Essential activity groups required to implement the Proposed Action include garrison construction, training facilities and range construction, live-fire training, and maneuver training. A brief description of each activity is provided in the following sections.

2.3.1 Garrison Construction

This activity group includes the construction of administrative offices, housing and child care facilities, vehicle parking and maintenance, equipment storage, recreational facilities, roads, and

other infrastructure required to meet the administrative and readiness requirements of Army units while supporting a high quality of life for Soldiers and Families.

The Army plans and programs for standard sets of facilities that are needed to support modular Army units. Each unit has a distinct facilities requirement for conducting garrison administrative and maintenance operations. Critical facilities required by Army units would include office space for brigade, battalion and company Headquarters units, barracks space for single enlisted Soldiers, Family housing, dining facilities, maintenance shops, parking for vehicles, and storage space. The exact number of buildings and square footage/yardage of facilities space depends on the specific type of unit, number of Soldiers in the unit, and its equipment storage and maintenance requirements. Table 2.1 below lists facilities requirements for different Army units. Table 2.1 provides a generalized estimate for 1,000 and 3,000 Soldier stationing scenarios which are not unit specific and therefore do not allow exact determinations to be made. For these scenarios, estimates of garrison facilities requirements are based on standard Army planning factors for Army Brigades. Exact facilities requirements have been provided for the modular Fires Brigade and Medium Combat Aviation Brigade from the Army's standard facility allowances database. Upon receiving decisions for final unit stationing, installations will be able to more accurately determine additional facilities requirements. The installation may undertake additional environmental analysis of the potential impacts associated with such stationing decisions. Facilities construction requirements depend on the availability of existing facilities at the installation and the availability of funding to execute construction projects. If existing facilities are available at the installation to support unit stationing, then those facilities will not need to be constructed.

Table 2.1 Estimate of Standard Garrison Construction Facility Allowances

Garrison Facilities	1,000 Support Unit Soldiers	3,000 Support Unit Soldiers	1,600 Fires BDE Soldiers	2,800 AVN BDE Soldiers
Vehicle Fuel Storage (gallons)	151,660	454,980	227,090	700,000+
Brigade Offices (sf)	0	39,495	20,734	17,656
Battalion Offices (sf)	22,211	66,633	41,223	63,305
Company Offices (sf)	104,849	314,547	159,100	302,623
Organization Classroom (sf)	4,116	12,348	13,755	22,925
Ammunition Storage (sf)	572	1,736	1,500+	2,000+
Unit Storage Buildings (sf)	41,600	124,800	36,295	34,050
Family Housing (on/off post availability) (sf)	819,643	2,458,929	1,229,464	2,049,107
Barracks Space (sf)	147,760	443,280	278,196	346,602
Military Vehicle Parking (sf)	385,056	1,155,168	1,035,117	1,476,810
Vehicle Maintenance (sf)	25,186	75,558	80,234	84,365
Aircraft Maintenance Hangar	0	0	0	295,370

In addition to garrison operations and maintenance facilities for Army units, the Soldiers and their Families may also require select specialized facilities such as medical clinics or hospitals, child care centers, recreational or other facilities. The exact requirements for these facilities would be based on the installation's existing facilities capacity and number and type of new units they would receive. Exact construction requirements for unit stationing actions would be determined at the installation depending on these factors.

2.3.2 Training Facilities and Range Construction

This activity group includes the construction of training ranges and training facilities needed to maintain the training readiness of combat support units. Army Training Circular TC 25-8 *Training Ranges* describes the standard designs and requirements of the Army's Sustainable Range Program for training modular Army units to standard.

In order to meet the needs of the Proposed Action, the permanent stationing locations must be able to train units to meet training readiness standards. To accomplish this, stationing locations must either have existing ranges or be able to accommodate the construction of new ranges required by additional units stationed as part of the Proposed Action. Range requirements will vary greatly with the capacity of existing ranges at installations, the extent of range modernization the installation has undergone, and the number and types of units Proposed for stationing at a given installation. In general, combat support and combat service support units do not increase an installations requirement for Combined Arms Live Fire Exercise (CALFEX) ranges. Units would support CALFEX exercises of combat units but would not contribute to increased CALFEX training requirements. Support units must conduct semi-annual individual and crew served weapons qualifications and qualify all vehicle mounted weapons systems. The installation must have adequate capacity to support weapons qualifications of units to be stationed as part of the implementation of the Proposed Action. This may involve construction of new ranges. A brief description of required qualification ranges is provided below.

Qualification Training Range (QTR): This range is a multi-functional range that can meet the weapons qualifications requirements for multiple weapons systems to include pistols, rifles, machine guns, and other crew fired weapons systems. This range combines the capabilities of the Modified Record Fire Range, Sniper Field Fire Range, Combat Pistol Qualification Course, MK-19 Range, and the Multipurpose Machine Gun Range.

25 Meter Zero Range: This range is used to train Soldiers in basic marksmanship. This range teaches Soldiers techniques to engage stationary targets and sighting adjustment techniques. It can be support M16 or M4 rifle firing as well as that of crew served machine guns.

Modified Record Fire Range (MRF): This range is used to train support unit Soldiers in basic marksmanship tasks. The range teaches Soldiers to quickly aim and engage stationary infantry targets.

Combat Pistol Qualification Course (CPOC): This combat pistol range is used to train Soldiers to identify, engage, and defeat an array of targets using the 9mm, .38 caliber, or .45 caliber pistol.

Multipurpose Machine Gun Range (MPMG): This range is designed to train Soldiers to engage stationary infantry targets, moving infantry targets emplacements, and stationary armor targets with the full range of Army machine guns to include the M249, M60, M240, and .50 caliber machine guns.

Sniper Field Fire Range / Known Distance (KD) Range: This range is used to train Soldiers to identify and engage stationary and moving targets with a sniper rifle.

Grenade Launcher Range: This range is used to train Soldiers on targeting and use of grenade launcher systems against stationary infantry and vehicular targets.

1 Mark-19 Range: This range is used to train Soldiers on the operation and use of the Mark-19 40
2 mm grenade machine gun.

3
4 Hand Grenade Qualification Course: This range is used to train Soldiers on techniques for
5 employing hand grenades in close combat.

6
7 Convoy Live Fire Range: This range is teaches Soldiers and units how to respond to an ambush
8 situation and defend a convoy from attack.

9
10 Urban Assault Course: This range trains Soldiers and units on tasks necessary in urban and
11 built up areas.

12
13 Light Demolition Range: This range trains Soldiers in the employment of demolitions and
14 explosive charges. Required for Engineer and Explosive Ordnance Detachment units.

15
16 **Engineer Qualification Range: The range trains engineer Soldiers on a variety of tasks,
17 including heavy equipment operations, construction, and bridging.

18
19 **Field Artillery Indirect Range: This range is used specifically to train field artillery crews on the
20 skills necessary to apply fire mission data, engage and hit stationary targets in tactical array.

21
22 **Aviation Gunnery Range (Digital): This range is used specifically with aviation units to train
23 crews on the skills necessary to identify, engage, and hit ground targets.

24
25 ** Identifies ranges for specific support units.

26
27 TC-25-8 defines the training range infrastructure required to ensure that units can adequately
28 prepare for operational deployment. Access to the proper training range infrastructure is a
29 critical element of need for the Proposed Action.

30 31 **2.3.3 Live-fire Training**

32
33 Live-fire training is an essential component of Army training and of the implementation of the
34 Proposed Action. To be operationally effective, Soldiers must have the skills and experience
35 necessary to operate and maintain their weapons. Live-fire involves munitions, explosives, and
36 non-explosive training rounds designed to meet Soldiers' training needs to prepare them for
37 combat and peace support operations. Soldiers must "train as they fight" in order to ensure their
38 safety in combat situations. At a minimum, all Soldiers must qualify on individual and
39 crew/vehicle weapons at least twice per year. In addition, platoons, companies, and battalions
40 must conduct collective live-fire training exercises on firing ranges to ensure they have
41 rehearsed and coordinated battle procedures and are prepared to deploy to support wartime
42 operations. Various weapons systems use different types of munitions. Where possible, some
43 weapons systems use inert training rounds as a substitute for the firing of live rounds.

44
45 Live-fire training requirements for Combat Support (CS) and Combat Service Support Soldiers
46 (CSS) have recently been increased to incorporate training tasks which address current
47 operational threats to Soldiers and ensure that all Soldiers have the opportunity to gain
48 maximum proficiency with their weapons. In addition to conducting individual and small unit
49 training tasks on the Qualification Training Range, CS and CSS Soldiers now routinely train on
50 the Convoy Live-Fire Range to prepare to defend against ambush attacks. On this range
51 vehicle crews train to react to ambushes, explosive devices, casualty treatment and medical

1 evacuation tasks. CS and CSS units may train on other types of ranges based on the
2 Commander's assessment of unit training requirements and mission essential tasks. DA PAM
3 350-38 identifies that urban operations training for CS/CSS units may be required depending on
4 the Commander's assessment of his units training needs. CS and CSS units must train on
5 Convoy Live-fire ranges and qualify with their individual and crew-served weapons at a
6 minimum, however.

7
8 In addition to individual and crew served weapons qualifications, Fires Brigades must also
9 conduct indirect fires training. Fires Brigade (artillery) training includes forward observation of
10 targets and communication of target grid coordinates from artillery forward observers. Fires
11 Brigades include 1.55 mm howitzer artillery pieces as well as Multiple Launch Rocket Systems
12 (MLRS) which much practice target acquisition and firing of training ordnance.

13
14 Live-fire training requirements for a combat aviation brigade includes limited individual weapons
15 qualification activities. Most pilots and crew members must qualify with service pistols.
16 Maintenance crews qualify with pistols, rifles and machine guns. Qualification requirements
17 include door-gunners qualifications with mounted machine guns for select crew members. In
18 addition, attack helicopter crews must engage armored targetry arrays with helicopter weapons
19 systems.

20 21 **2.3.4 Maneuver Training**

22
23 Maneuver training is a critical component of the unit training plan that trains units on how to
24 synchronize the execution of tasks on the battlefield prior to actual deployment. Maneuver
25 training builds on all of the individual skills that Soldiers possess and tests each echelon of
26 command. Maneuver training may be augmented with live-fire training exercises to consolidate
27 training requirements and ensure that Soldiers are training realistically and to proficiency
28 standards. Platoons, companies, and battalions conduct maneuvers to ensure unit proficiency
29 at each successive level of Command. Army Training Circular 25-1 *Training Land* (Department
30 of the Army 2004) is the Army's definitive source for defining maneuver training land
31 requirements.

32
33 Army units must conduct "combined-arms" training to ensure that all of the units' capabilities can
34 be integrated and synchronized to execute missions under stressful operational conditions.
35 During combined-arms maneuver training events, CS and CSS units work with combat
36 maneuver units to conduct combat and peace support operations. CS/CSS units, which are
37 being considered for stationing as part of the Proposed Action, will conduct routine small unit
38 maneuvers and will deploy in support of BCTs to conduct integrated maneuver training events.
39 This involves multiple weeks of field deployment to local training areas at the installation and the
40 utilization of other maneuver training resources.

41
42 Each platoon and company must train up to 5 weeks per year to meet maneuver training
43 requirements. In addition, each battalion must conduct semi-annual maneuvers lasting
44 approximately 4 to 6 weeks per year to certify its subordinate units and each brigade must
45 conduct maneuvers every 12 to 18 months and in advance of operational deployments, as
46 required.

47
48 The maneuver training requirements of a fires brigade are similar to that of CS units. Fires units
49 will deploy in support of integrated "combined-arms" maneuver and live fire training events.
50 Each platoon will conduct up to 5 weeks of platoon and company training per year as small units
51 with a larger maneuver rotation (typically 3 weeks) held semi-annually.

Aviation units would support 4 to 6 weeks of integrated maneuver training each year at designated maneuver areas. In addition, pilots would maintain flight-status by conducting routine flight operations on a monthly basis.

2.4 Descriptions of Units and Activities

2.4.1 CSS Logistics (Sustainment) Units

Introduction. Sustainment units are responsible for the transport of fuel, munitions, parts, food, medical supplies, and battlefield casualties during training and operational scenarios. In addition, these units maintain vehicles, recover destroyed or damaged vehicles, and provide medical care to injured Soldiers. CSS units consist primarily of transportation, quartermaster, and medical units and functions. CSS units utilize a wide variety of vehicles, based in part on the types of units they are supporting and the missions they need to accomplish. Wheeled vehicles are capable of on-road and off-road maneuver, but will more often travel on-road. The number of Soldiers in each unit varies with the function and mission of specific units.

Transportation Units.

Mission. The mission of the Transportation component is to transport, distribute and issue general military supplies and equipment, to include: ammunition; fortification and construction material; water, subsistence, and water purification equipment; petroleum products; repair parts and end items; and medical supplies.

Soldiers. Units typically consist of company sized detachments of 100 - 200 Soldiers.

Primary Equipment. HMMWVs and other light trucks, cargo trucks with 5 ton and larger capacity, fuel trucks (5000 gallon), and Heavy Equipment Transport (HETs) trucks for transporting armored combat vehicles.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. Soldiers will also conduct convoy live fire training and urban operations on an as needed basis.

Maneuver training consists of individual training and collective training at the platoon and company levels. The primary training events are loading, transporting and unloading cargo. Unit movements and logistical sites will be on roads, trails and maneuver areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Units will conduct multi-day small unit (platoon and company) training exercises as often as 5 times per year at each echelon of training, and collective large unit exercises (above battalion level) typically 2 to 3 times annually. Training impacts will also vary according to the size and weight of unit equipment and the types of activities the unit must engage in as part of its doctrinal operations.

Quartermaster Units

Mission. The mission of the Quartermaster component is to receive, store, and issue general military supplies and equipment, to include: fortification and construction material; water, subsistence, repair parts, and medical supplies.

Soldiers. Units typically consist of platoon to company sized detachments of 30 - 120 Soldiers.

Primary Equipment. HMMWVs and cargo trucks with 5 ton capacity.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually.

Maneuver training consists of individual training and collective training at the platoon and company levels. Quartermaster units will deploy on multi-day training events up to 5 times per year at platoon and company echelons. These units will typically deploy 2-3 times per year to support large unit (above battalion) training events when at home station. The primary training events are unloading, storing, and loading cargo. Training impacts will also vary according to the size and weight of the truck and cargo.

Medical Units

Mission. The mission of the Medical component is to provide health care support at Army installations and during training and operational deployments.

Soldiers. Varies with type of medical unit and function.

Primary Equipment. HMMWVs, some configured as medical evacuation vehicles, and cargo trucks with 5 ton capacity.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually.

Maneuver training consists of individual training and collective training at the platoon and company levels. The primary training events are moving to or relocating medical operations, establishing unit medical operations, performing Combat Health Support, and defending the unit location. Unit movements and logistical sites will be on roads, trails and maneuver areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Units will support multi-day training exercises and provide attachment support for integrated training exercises on an as needed basis. Typically medical squads, platoons, or companies will deploy on multi-day training events up to 5 times per year at each unit echelon. These units will typically deploy 2-3 times per year to support large unit (above battalion) training events when at home station. Small units will train at the squad and platoon level to retain their training proficiency.

2.4.2 Headquarters Units

Introduction. Headquarters units are responsible for the command and control of units in garrison and during training and operational deployments. Headquarters units collect

information, conduct plans and staffing, and disseminate guidance to subordinate units. These units are typically collocated with combat maneuver units during maneuver rotations. Headquarters units utilize an array of light trucks, HMMWVs, 5 ton medium trucks, and armored wheeled vehicles during training. The number of Soldiers in each unit also varies by the echelon of the headquarters element and its mission.

Mission. The mission of the Headquarters units includes collecting information, conducting planning and staffing, disseminating guidance to subordinate units, and overseeing operations.

Soldiers. Units' size varies with the mission and function of the headquarters but may range from 50-400 depending on the span of operational control and number of subordinate units.

Primary Equipment. HMMWVs and other light trucks, cargo trucks with 5 ton and larger capacity, and M577 tracked personnel carriers.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. Soldiers will also conduct convoy live fire training and urban operations on an as needed basis. Weapons qualifications usually involve pistol, rifle and limited crew served weapons qualification with heavy machine guns (.50 caliber).

Maneuver training consists of maneuvering on trails and in maneuver areas, establishing Tactical Operations Centers (TOCs) at select locations and establishing communications infrastructure to monitor events and control battlefield operations. Headquarters units will typically support between 4-6 maneuver rotations annually. Each of these rotations could involve 2-3 week deployments in support of joint training exercises, brigade training events, and battle command simulation exercises for command headquarters units. These simulation exercises test commanders and the proficiency of headquarters units using computer simulated scenarios. Exercises take place in a replicated tactical scenario and may or may not involve the training maneuvers of vehicles in a tactical setting.

2.4.3 Combat Support (CS) Units

Introduction. Combat support units work directly with combat maneuver units to provide additional skill sets and capabilities to accomplish combat and peace support operations. The role of combat support units spans a wide array of mission functions. Primary functions of combat support units include providing engineering support, military police functions, chemical response capability, explosive ordnance detection and disposal, and other support missions. CS units consist primarily of engineers, military police, and chemical and explosive ordnance units. CS units utilize a wide variety of vehicles, based on the units' mission and support role. Equipment includes tracked or wheeled vehicles depending on the units' mission. Combat support units will engage in on and off-road maneuver in support of combat maneuver units.

Engineer Units

Mission. The mission of engineer units is highly variable and diverse. In combat, engineer units may support the movement of combat maneuver units through bridging, minefield clearance, demolitions, and other functions. Construction engineers plan, prepare and provide project survey and design plans, conduct construction and repair of roads and buildings and provide a variety of support to military and civil construction efforts.

Soldiers. Engineer units typically consist of companies totaling between 100-180 Soldiers.

Primary Equipment. HMMWVs and other light trucks, cargo trucks with 5 ton or greater cargo capacity; construction equipment such as bucket loaders, bulldozers, road graders, cranes and concrete mixers. Combat engineers utilize a variety of armored personnel carriers, small excavators, bridge-laying vehicles, and tracked earth-movers. Route clearance units utilize v-hulled armor-plated vehicles as part of the units authorized equipment.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. In addition, combat engineers must maintain proficiency with use of demolitions charges.

Maneuver training consists of individual equipment training and collective training at the platoon and company levels. Maneuver training events vary with the mission of the engineer unit. Engineers in combat support roles maneuver on trails and off-road with their vehicles supporting the maneuver requirements of combat units. Construction engineers move to and from construction sites, occupying construction sites and conducting the specific horizontal (roads and trails), vertical (buildings and structures), and concrete projects. Construction engineer units also move from position to position and set up their construction operations in each one. Unit movements and positions will be on roads, trails and maneuver areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Units will conduct small unit (platoon and company) multi-day training maneuvers as often as 5 times per year at each echelon of training, and collective large unit exercises as often as 2-3 times annually. Training impacts will also vary according to the size and weight of unit equipment and the types of activities the unit must engage in as part of its doctrinal operations.

Military Police (MP) Units

Mission. The mission of the Military Police component is to provide force protection, law enforcement and prisoner detention in combat operations across the battlefield operating space.

Soldiers. MP units typically operate as company-sized units totaling between 100- 200 soldiers which are attached to other Army units.

Primary Equipment. HMMWVs, Armored Security Vehicles (ASVs), and cargo trucks with 5 ton capacity.

Training. Live-fire training consists of individual weapons and crew-served weapons practice and qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. Select MP units are also required to engage in collective training on multi-purpose training ranges to practice engaging targets and coordinating fires from mounted weapons platforms while engaged in maneuver activities.

Maneuver training consists of individual training and collective training at the platoon and company levels. The primary training events are mounted and dismounted security operations, patrolling, movement control in forward operating areas, and prisoner detention, protection, and transport. Unit movements and positions will be on roads, trails and maneuver areas. Force

1 protection training (ex. convoy defense, position perimeter defense) is integrated into all training
2 missions. Units will conduct multi-day platoon and company level maneuvers as often as 5
3 times annually at each training echelon, and participate in collective unit maneuver rotations in
4 support of battalions of BCTs 2-3 times annually. A majority of maneuver training would occur
5 on trails, roads, and other built up areas.

6 **EOD Units**

7
8
9 **Mission.** The mission of the EOD component is to identify, disarm, render safe, destroy and
10 dispose of explosive devices and ordnance in combat and garrison operations.

11
12 **Soldiers.** EOD units are assigned as detachments, platoons or company sized units ranging
13 from 20 - 200 Soldiers.

14
15 **Primary Equipment.** HMMWVs (sometimes armored) and cargo trucks with 5 ton capacity.

16
17 **Training.** Live-fire training consists of individual weapons and crew-served weapons.
18 Individual and crew served weapons training occurs on fixed ranges with firing points and
19 targets contained within a marked area and boundaries. Soldiers and crews train and qualify on
20 these weapons twice annually. EOD training also consists of identifying and rendering safe
21 mines, explosive devices, and ordnance. These include inert and live explosive devices. EOD
22 units utilize demolitions ranges and impact areas to conduct demolitions training.

23
24 EOD units conduct small unit maneuvers typically at the crew and platoon level. Training
25 events include the movement to sites with suspected ordnance and the detection and
26 disarmament of suspected devices. Unit movements would be primarily on roads, trails and
27 built up areas. Force protection training (ex. convoy defense, position perimeter defense) is
28 integrated into all training missions. EOD units conduct multi-day small unit maneuver
29 operations up to 5 times per year at platoon and company levels, and would support training
30 rotations of battalion and BCT units 2-3 times per year in addition to squad proficiency training.

31 **Chemical Corps Units**

32
33
34 **Mission.** The mission of chemical units is to protect U.S. forces and their allies from chemical,
35 nuclear, or biological attack. Chemical Corps units provide equipment and training on protection
36 from attack by non-conventional weapons through the use of detection and decontamination
37 equipment.

38
39 **Soldiers.** Chemical units are assigned as detachments, platoons or company sized units
40 ranging from 20 - 120 Soldiers.

41
42 **Primary Equipment.** HMMWVs and other light trucks, cargo trucks with 5 ton capacity, trucks
43 for decontamination, tracked vehicles.

44
45 **Training.** Training consists of individual weapons and crew-served weapons. Individual and
46 crew served weapons training occurs on fixed ranges with firing points and targets contained
47 within a marked area and boundaries. Soldiers and crews train and qualify on these weapons
48 twice annually. Chemical training also consists of identifying and neutralizing chemical, nuclear
49 and biological threats and decontaminating units hit with chemical agents. Chemical units also
50 assist in delivery and planning for use of obscurants to facilitate combat operations.

Chemical units conduct small unit maneuvers typically at the crew and platoon level. Training events include the movement to sites of suspected chemical contamination and the establishment of unit decontamination sites. Unit movements would be primarily on roads, trails and built up areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Chemical units would typically support several multi-week training rotations of battalion and BCT units 2-3 times per year.

2.4.4 Multi-functional Combat Support Brigades

Fires Brigade.

Mission. The mission of the Fires Brigade is to plan, prepare, provide and assess indirect ordnance fire requirements in close support of and precision strike artillery or ordnance weapons fire for maneuver forces.

Soldiers. A Fires Brigade with a High Mobility Artillery Rocket System battalion and 1.55 howitzer artillery pieces consists of approximately 1,600 Soldiers.

Primary Equipment. HMMWVs and cargo trucks with 5 ton or greater cargo capacity; towed or self propelled 105mm and 155mm howitzers, High Mobility Artillery Rocket Systems (HIMARS); and small Unmanned Aerial Systems (UAS). Each battalion contains between 18-24 cannons or rocket systems, and each brigade will have 2 or more battalions, based on task organization.

Training. Live-fire training consists of individual weapons, crew-served weapons and artillery cannon and rocket systems (practice and qualification). Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. Cannons and rocket systems fire into restricted access duded impact areas from multiple temporary firing points on ranges and in maneuver areas. Units will conduct live-fire training as often as 6 times annually.

Maneuver training is collective training at the battery, battalion and brigade levels. The primary training events are movement to and from firing positions, occupying firing positions, and firing cannons and rockets from these firing positions. This training is supported by command and control units, target acquisition units, signal units and logistical (supply, ammunition, maintenance and medical) units. These units also move from position to position and set up their operations in each training scenario. Unit movements and positions will be on roads, trails and maneuver areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Fires Brigade training can be supported by Unmanned Aerial Vehicles (UAV), which are flown to identify and relay information on artillery targets. All the maneuver training described here is executed in conjunction with live-fire training or in a "dry-fire" method, as often as 12 times annually. Fires Brigade units would conduct multi-day small unit maneuver operations up to 5 times per year at platoon and company levels, and would support training rotations of battalion and BCT units 2-3 times per year in addition to squad proficiency training.

Combat Aviation Brigade.

Mission. The mission of the Combat Aviation Brigade is to plan, prepare, and provide aviation close combat attack, reconnaissance, security, assault, lift, MEDEVAC and general support for maneuver forces.

Soldiers. The Combat Aviation Brigade consists of between 2500 - 2900 Soldiers.

Primary Equipment. The unit helicopters include: AH-64 (Apache and Cobra) Attack Helicopters, AH-60 (Blackhawk) Multi – purpose and CH-47 (Chinook) Multi – purpose. HMMWVs and cargo trucks with 5 ton and larger capacity.

Training. Live-fire training consists of individual weapons, crew-served weapons and helicopter cannon, rocket and machine-gun practice and qualification. Individual, crew served and helicopter weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually. Cannons and rocket systems fire into restricted access duded impact areas from multiple temporary firing points on ranges and in maneuver areas. Units will conduct live-fire training as often as 3 times annually.

Maneuver training is collective training at the company, battalion and brigade levels. The primary training events are establishing operational and logistical sites, performing a wide range of combat support flight missions, and conducting aerial gunnery. Aviation support units also move from position to position and set up their rearming, refueling and repair operations. Unit movements and positions will be on roads, trails and maneuver areas. Force protection training (ex. convoy defense, position perimeter defense) is integrated into all training missions. Aviation units would support 4 to 6 weeks of integrated maneuver training each year at designated maneuver areas. Aviation unit pilots would also maintain individual flight certification and support small-unit and joint operations as required.

Maneuver Enhancement Brigade (MEB).

Mission. The mission of the MEB is to enable and enhance the freedom of maneuver of a supported Army, joint, or multinational headquarters. The MEB augments maneuver capabilities to ensure the freedom of movement and security of Army combat maneuver forces and logistical operations. The MEB is a command and control Headquarters that can be tailored to mission requirements to provide specific maneuver, protection and logistics support roles. For the purposes of environmental analysis, the activities of the MEB are the same activities that would be engaged in by engineer, MP, signal, headquarters and other combat support units. The stationing of an MEB is therefore considered a stationing of additional CS Soldiers as the projected impacts anticipated to be the same.

Soldiers. An MEB consists of approximately 570 Soldiers.

Primary Equipment. HMMWVs and cargo trucks with 5 ton or greater cargo capacity; Armored personnel carriers, logistics trucks, armored security vehicles, and up-armored HMMWVs.

Training. Live-fire training consists of individual weapons and crew-served weapons qualification. Individual and crew served weapons training occurs on fixed ranges with firing points and targets contained within a marked area and boundaries. Soldiers and crews train and qualify on these weapons twice annually.

As primarily a headquarters unit, MEB maneuver training consists of maneuvering on trails and in maneuver areas, establishing Tactical Operations Centers (TOCs) at select locations and establishing communications infrastructure to monitor events and control battlefield operations. The MEB will typically support between 4-6 maneuver rotations annually. Each of these

1 rotations could involve 2-3 week deployments in support of joint training exercises, brigade
2 training events, and battle command simulation exercises for command headquarters units.
3 These simulation exercises test commanders and the proficiency in providing command and
4 control functions to subordinate MEB units using computer simulated scenarios. Exercises take
5 place in a replicated tactical scenario and may or may not involve the training maneuvers of
6 vehicles in a tactical setting.
7
8
9
10

3.0 ALTERNATIVES AND SCREENING CRITERIA

3.1 Introduction

This chapter discusses the several different alternatives the Army is considering for implementing the Proposed Action. The Purpose and Need described in Chapter 1 set forth a rational context in which to analyze the viability of alternatives. The Purpose and Need define necessary elements of the Proposed Action and allow for consideration of a broad range of alternatives for potential growth and realignment of Army's forces to support the operations of the PACOM and other Army missions. This chapter will provide a discussion of the alternative selection criteria that the Army is using to assess whether an alternative is "reasonable" and will be carried forward for evaluation in the draft EIS. The screening criteria were developed based on the Purpose and Need for the Proposed Action set forth in Chapter 1.0. In addition, this chapter will discuss criteria used to select candidate installations for stationing actions to support Army Growth and realignment of the force.

Three alternatives and the "no action" alternative have been analyzed for implementing the Proposed Action. Installations have been included in the SPEIS if they are viable stationing locations capable of supporting 1,000 or more additional Combat Support/Combat Service Support (CS/CSS) Soldiers and they are capable of supporting Pacific theater mission requirements.

This SPEIS evaluates different stationing scenarios, to include stationing of units at locations within the CONUS. Environmental analysis of these installations was conducted as part of the Army's Programmatic EIS in 2007, which is incorporated by reference. Environmental analysis of this supplement to the PEIS will focus on installations and training areas in Hawai'i and Alaska, though decisions may include CONUS installations as well.

3.2 Assumptions Applied To Army Screening Criteria

3.2.1 Regional Security Mission Requirements

To support regional security goals and objectives, PACOM and USARPAC must be prepared to handle contingencies involving a number of potential conflict, counter terrorism, humanitarian aid, and peace support scenarios. Commanders must have the ability to deploy the appropriate number and type of forces to support global operations such as the wars in Iraq and Afghanistan as well as various contingency operations across the PACOM area of operations. New and realigned forces must be capable of deploying from their selected stationing location to support PACOM mission requirements.

3.2.2 Military Construction (MILCON) Limitations

Reasonable alternatives must include Army installations that have existing facilities to support the stationing of new Army units or have sufficient space and support infrastructure to allow construction of needed facilities in a timely manner. This includes facilities for training Army units as discussed previously and providing an acceptable quality of life for both Soldiers and their Families.

Facilities for training, garrison operations, and Soldier and Family quality of life are critical for supporting the operations of new units that would be stationed at installations as part of the Proposed Action. A lack of adequate facilities to house, train, administer, and maintain

equipment would not meet the Army's needs for the Proposed Action. If facilities do not currently exist at the installation to accommodate new units, facilities construction would be required. It would take several years to construct new facilities and have them available for use by new units.

3.3 Programmatic Alternatives Carried Forward for Analysis

In addition to the No-Action alternative, three action alternatives have been formulated that take into account the need for Army growth and force realignment from 2008 to 2013. All alternatives assume BRAC recommendations and those Global Defense Posture Realignment (GDPR) recommendations that have either already occurred prior to Fiscal Year 2008 as part of the baseline condition for analysis. The Army has determined that the alternatives below meet the screening criteria and are therefore reasonable. Alternatives in the SPEIS could include stationing of additional Combat Support (CS) or Combat Service Support (CSS) units, headquarters units, or new multi-functional support brigades. Stationing of new Brigade Combat Teams to support Pacific theater operations is not part of the Proposed Action. In addition to the major training installations the Army considered in its 2007 Final Programmatic Environmental Impact Statement (PEIS), the Army has considered 4 additional locations that can reasonably support the Proposed Action. Analyses of environmental impacts from the 2007 PEIS are incorporated by reference to support the Army's decision-making process. The focus of analysis in Chapter 4 of this SPEIS is therefore on the four new sites that the Army has determined to be viable stationing locations capable of meeting the needs of the Proposed Action. New sites (not in the 2007 PEIS) capable of supporting the stationing of new units to support Pacific theater operations include Fort Richardson, Alaska; Fort Wainwright, Alaska; Schofield Barracks Military Reservation (SBMR), Hawai'i; and Fort Shafter, Hawai'i. The total number of Soldiers listed under each alternative reflects the approximate number of all Soldiers who would be stationed there. Alternatives carried forward for full analysis are:

3.3.1 Alternative 1- Grow, transform, and realign forces to support operations in the Pacific by implementing Army-wide modular force recommendations to modularize force structure of existing units.

Alternative 1 would implement the Army-wide modular force recommendations discussed in Chapter 1 to continue the implementation of Army transformation and adapt existing USARPAC units best to organize them to counter current emergent threats and accomplish future operations. Modularity-based recommendations as part of this alternative include adjustments in the number and type of existing CS, CSS, and Headquarters units stationed in the Pacific Theater.

As part of this alternative, Army installations would experience unit gains through stationing and transfer of units from other installations, and losses through deactivations and transfers of existing units to other installations.

A summary of stationing actions supporting the Proposed Action that would occur as part of the implementation of Army-wide modularity and GDPR recommendations (Alternative 1) are included in Table 3-1 below. Table 3-1 shows the total number of Soldiers the Army would add or lose at installations as part of Alternative 1. As discussed in the 2007 Final PEIS, every Army installation is experiencing unit reconfiguration, unit gains through stationing, and losses through deactivations as part of conversion to the modular force. These actions are required to implement Army Transformation and are occurring relatively uniformly at every installation

depending on the number and type of units they support. As most of these changes involve augmentations to existing units, these units must be stationed at the location of the unit they are augmenting or the unit they must support.

**TABLE 3.1 Modular Force Changes to Existing Army Units
(Alternative 1)**

FT RICHARDSON

UNIT NAME	SOLDIER AUTHORIZATION
4/25th IBCT Modular Force Changes	16
716th Explosive Ordnance Det.	21
95th Chemical Company	2
Aerial Support Detachment	4
486 Transportation Detachment	21
Medical Forward Surgical Team	10
23 rd Engineer Company	100
84 th Engineer Support Company (Airborne)	121
Combat Sustainment Support Battalion (CSSB)	78
Realignment of C 84th EN CO	-143
TOTAL	230

FT WAINWRIGHT

UNIT NAME	SOLDIER AUTHORIZATION
1/25th SBCT Modular Force Changes (Drivers & Deputy Cmd.)	16
1/25th MP Platoon Augmentation	42
65th Explosive Ordnance Company	44
Deactivation of 20th PA	-8
TOTAL	94

TABLE 3.1 Modular Force Changes to Existing Army Units (Alternative 1 Continued)**SCHOFIELD BARRACKS**

UNIT NAME	SOLDIER AUTHORIZATION
74th Ordnance	44
Headquarters 30th Ordnance	36
71st Chemical Company	6
Theater District Element	26
Transition Theater Opening Elem.	54
25th Light / Med Truck Company	171
706th Ordnance	44
BCTs (1/25 & 2/25 th) Additional Authorizations	98
34 th Engineer Clearance	191
95 th Engineer Company (Clearance)	91
249 th Engineer Company (Prime Power Augmentation)	40
Medical Forward Surgical Team	6
TOTAL	807

FORT SHAFTER

UNIT NAME	SOLDIER AUTHORIZATION
Signal Command - Theater	36
8th Sustainment CMD HQ (HHC)	154
TOTAL	190

The implementation of Alternative 1 includes construction of cantonment facilities, training infrastructure construction, and the execution of live-fire and maneuver training needed to support unit changes and realignments as part of Army modularity. Chapter 4 discusses actions that the Army would undertake at each location in more detail.

The specific structure changes and initiatives associated with these units are:

4/25th IBCT Modular Force Changes, 1/25th SBCT Modular Force Changes (Drivers & Deputy Cmd.), 1/25th MP Platoon Augmentation: Modular Changes to Brigade Combat Teams. These are changes to Brigade Combat Teams already in Alaska.

95th Chemical Company: Modular Force Structure Changes to existing Chemical units

Aerial Support Detachment: Army-wide structure change

486th Transportation Detachment: This is a Movement Control Team, required for to support existing theater-level transportation units in Alaska

Medical Forward Surgical Teams (Fort Richardson and Schofield Barracks): Modular Forward Surgical Team initiative

23rd Engineer Company, 84th Engineer Support Company (Airborne): These are Sapper and Forced Entry Packages being sent to Airborne Brigade Combat Teams, including the one in Fort Richardson

Combat Sustainment Support Battalion (CSSB): This is an Army-wide structural change to provide command and control for units already at Fort Richardson. This unit is the higher headquarters for support elements that are not part of the BCTs.

65th Explosive Ordnance Company, 716th Explosive Ordnance Det, 74th Ordnance, 706th Ordnance: Structural changes to explosive ordnance unit already assigned to Fort Richardson, Fort Wainwright, and Schofield Barracks

Headquarters 30th Ordnance: These Soldiers augment a current unit.

Theater District Element, Transition Theater Opening Element: These are modular components of a Theater Support Command. They are augmentations to the 8th Theater Support Command, already in Hawai'i.

25th Light / Med Truck Company: This unit was supposed to be disbanded. It will now remain in Hawai'i. Its capabilities are still required.

71st Chemical Company: These companies are getting 6 additional crew members throughout the Army. This is an addition to a unit already in Hawai'i

34th Engineer Clearance, 95th Engineer Company (Clearance): These are Sapper and obstacle clearance companies being added to all Combat Engineer Battalions in the Army; they are augmentations to an existing Battalion in Hawai'i

249th Engineer Company (Prime Power Augmentation): This unit consolidates separate prime power (generator) detachments to provide central control and organization. The nucleus of this unit was already in Hawai'i

8th Sustainment CMD HQ (HHC): This unit provides command and control for support units.

Signal Command Theater: This units' mission is long-range communications management and operations, and is needed to provide signal coverage over a large theater of operations.

3.3.2 Alternative 2- In addition to those stationing actions in Alternative 1 that are part of the Army-wide modular force changes, the Army would station additional units needed to meet the specific mission requirements of the Pacific Theater.

As discussed in Field Manual Interim 3-0.1 *Modular Force*, every Army Theater command has modular core components that exist at theater commands across the Army. In addition to these core components, theater commanders request additional unit capabilities depending on their

mission requirements. As part of Alternative 2, the Army would grow and realign its forces to support the mission requirements of the Pacific Theater. Critical Army units requested by PACOM or USARPAC include a theater engineer command and supporting engineer units, a military police brigade and support units, and other high-demand CS units. PACOM has requested that the Army station an additional Engineer Brigade Headquarters and engineer support units to support its operations because of the theater's large disaster relief response requirement for construction engineers. In addition an engineer brigade headquarters is needed to provide command and control functions for existing engineer battalions in Alaska and Hawai'i. The theater does not currently have a higher headquarters to coordinate and manage engineering operations and this fills a vital need in a theater where engineering operations are critical. Alternative 2 includes implementing Army-wide modularity programs discussed above as part of Alternative 1. Table 3-2 shows new units, in addition to those discussed above under Alternative 1, that would be added to Army installations to support operations of the Pacific Theater. These units must be collocated with Theater, ASCC, or brigade elements to facilitate unit administrative functions, unit cohesion, training integration, and command and control functions.

**TABLE 3.2 Army Growth and Realignment to Support
Theater Mission Requirements (Alternative 2)**

FT RICHARDSON

UNIT NAME	SOLDIER AUTHORIZATION
6 th Engineer Battalion Headquarters (Construction Effects)	175
56 th Verticle Construction Engineer Company (6 th Engineer BN)	162
Horizontal Construction Engineer Company (6 th Engineer BN)	161
525 th Engineer Concrete Section (6 th Engineer Battalion)	12
240 th Engineer Survey Team (6 th Engineer Battalion)	14
545th Military Police Company	170
Ordnance Company (Ammunition Handling)	47
74 th Signal Company	41
Aerial Support Platoon	86
TOTAL	868

FT WAINWRIGHT

UNIT NAME	SOLDIER AUTHORIZATION
472nd MP CO	170
559th Horizontal Engineer Company (6 th Engineer Battalion)	161
TOTAL	331

**TABLE 3.2 Army Growth and Realignment to Support
Theater Mission Requirements (Alternative 2)**

SCHOFIELD BARRACKS (ALTERNATIVE 2 GROWTH)

UNIT NAME	SOLDIER AUTHORIZATION
130th Engineer Brigade	124
Construction Management Team (130 th Engineer BDE)	9
15 th Engineer Detachment	7
69 th Engineer Company (Combat)	103
307 th Signal Battalion	118
558th Military Police Company	170
Military Police Detachment (19 th Criminal Investigation Division)	42
Warrior Unmanned Aerial Surveillance Unit	126
Warrior Transition Unit	164
	TOTAL
	863

FORT SHAFTER	TOTAL
	0

**SUMMARY OF TOTAL SOLDIER NUMBERS TO BE STATIONED
UNDER ALTERNATIVES 1 & 2 BY INSTALLATION:**

FORT RICHARDSON:	1,098 ADDITIONAL SOLDIERS
FORT WAINWRIGHT:	425 ADDITIONAL SOLDIERS
SCHOFIELD BARRACKS:	1,670 ADDITIONAL SOLDIERS
FORT SHAFTER:	190 ADDITIONAL SOLDIERS

The implementation of Alternative 2 includes construction of cantonment facilities, training infrastructure construction, and the execution of live-fire and maneuver training needed to support unit changes and realignments as part of Army modularity and growth and realignment to support theater mission requirements. Chapter 4 discusses actions that the Army would undertake at each location in more detail.

The reasons for stationing these units in their respective locations is as follows:

Fort Richardson Engineer Battalion and subordinate units. These units are specially tailored to provide support in the Pacific Theater and are needed to support the Stryker Brigade Combat Team already in Alaska. One subordinate unit is designated for Fort Wainwright in order to provide dispersion of assets and training support to units stationed there.

Aerial Support Platoon: This unit provides the PACOM Commander a long-range unmanned aircraft systems (UAS) capability.

545th MP Company: This unit is part of the Army's Military Police clustered stationing concept. It needs to go to Fort Richardson to both train for its combat mission and to support local law enforcement when other units are deployed.

472d MP Company: This unit is going to Fort Wainwright for the same reasons the 545th is going to Fort Richardson. Splitting these units between Forts Richardson and Wainwright supports local law enforcement efforts

130th Engineer Brigade: This Command and Control element is needed in Hawai'i to manage theater assets. Included in this unit is a construction management team. This unit provides construction and reconstruction services at every Army Engineer Brigade. The 15th Engineer Detachment and the 69th Engineer Company provide clearance and other engineering capabilities required for the Brigade's mission.

558th MP Company. This unit is also part of the Army's clustered stationing concept for Military Police units. This stationing action will give Hawai'i the total of four MP Companies necessary to achieve the clustered stationing goal.

19th Criminal Investigation Division: This unit is needed in Hawai'i to increase the capacity of law enforcement personnel to investigate serious crimes.

Warrior Unmanned Aerial Surveillance Unit: This unit control unmanned aircraft and provides the theater a critical intelligence-gathering capability.

Warrior Transition Unit: This unit will provide critical support to disabled Soldiers and their families. It is needed in Hawai'i because of the number of wounded Soldiers who are being treated and returned to civilian life there.

3.3.3 Alternative 3- Take actions to grow, transform, and realign Army forces to support Army modularity and Pacific Theater operations as discussed in Alternatives 1 and 2; in addition to these actions grow the Army to accommodate the stationing of a Maneuver Enhancement Brigade, a Fires Brigade, and a Combat Aviation Brigade to enhance PACOM operations and combat support capabilities in the Pacific Theater.

Alternative 3 includes implementing the recommended stationing actions of all of the programs discussed above as part of Alternatives 1 in addition and the growth discussed in Alternative 2. In addition, the Army would also station three multi-functional support brigades to support operations in the Pacific Theater. These brigades would include a Fires Brigade (approximately 1,600 Soldiers), a Maneuver Enhancement Brigade (approximately 570 Soldiers), and a Combat Aviation Brigade (approximately 2,800 Soldiers). These units provide additional flexibility and depth to PACOM's available force pool and would provide PACOM with increased capabilities to respond to a wide array of contingencies. These units could be stationed in Hawai'i, Alaska, or other locations in CONUS that are capable of deploying forces to support PACOM operations. Table 3.3 below summarizes the growth

Table 3.3: Stationing of a Fires Brigade and Combat Aviation Brigade to Support Operations in the Pacific (ALTERNATIVE 3)

Under Alternatives 1 and 2:

FORT RICHARDSON:	1,098 ADDITIONAL SOLDIERS
FORT WAINWRIGHT:	425 ADDITIONAL SOLDIERS
SCHOFIELD BARRACKS:	1,670 ADDITIONAL SOLDIERS
FORT SHAFTER:	190 ADDITIONAL SOLDIERS

Alternative 3:

*FIRES BRIGADE (LOCATION TBD): 1,607 ADDITIONAL SOLDIERS
*AVIATION BRIGADE (LOCATION TBD): 2,753 ADDITIONAL SOLDIERS
*MANEUVER ENHANCEMENT BRIGADE: 570 ADDITIONAL SOLDIERS

**Location for Multi-Functional Support Brigade Stationing remains TBD*

3.3.4 No Action Alternative - The No Action Alternative is to take no stationing actions to support the growth, realignment, and transformation of the Army to support operations in the Pacific

The No Action Alternative serves as a baseline condition for analysis. The No Action alternative includes those stationing decisions that have already been made to include stationing actions recommended by the BRAC Commission (BRAC 2005), as well as Army Global Defense Posture Realignment actions that took place prior to 2008. The No Action Alternative does not implement the most recent Army transformation and modular force recommendations. The No Action Alternative is not a viable means for meeting the current and future strategic security and defense requirements of the nation.

3.4 Screening Criteria Used To Identify a Range Of Potential Installation Stationing Locations

The Army used criteria of need defined in Chapter 1, in conjunction with other external limiting factors to narrow the field of installations to those capable of supporting the requirements of new unit stationing actions required by Army growth. This chapter describes the Army's decision-making process for selecting and analyzing viable stationing locations that could meet the Purpose and Need for the stationing of Army Growth units. The screening criteria include: supporting the NSS, NDS, and ACP, supporting strategic requirements of the Pacific Theater, possessing the capability to provide the necessary training infrastructure for new units, and the ability to provide quality of life and garrison support infrastructure. These screening criteria were applied to the full range of reasonable potential stationing locations capable of supporting Army growth. Specific criteria in this analysis used to screen the above alternatives include:

- 1. Support National Security and Defense policy, decisions made within the Quadrennial Defense Review (QDR), and support Army Transformation:**
Alternatives carried forward for analysis must promote, support, or be consistent with National Security and Defense policy, Army mission requirements, and the requirements of the QDR and Army Transformation. Alternatives must allow the Army effectively to support National Security and Defense Policy as well as Army Transformation and

implementation of modular forces initiatives (which support transformation). These documents lay out policy decisions that realign a majority of Army forces back to US installations from foreign countries.

2. **Capability to Deploy to meet Strategic Requirements of PACOM Support**

Operations in the Pacific Theater: PACOM is an active theater of operations. The PACOM Commander must conduct planning and prepare to support a broad range of operations across the full spectrum of actions the Army could be required to support in the Pacific Theater. Theater security requirements include operational planning for wartime, counter-terrorist, peace support, and stability operations. PACOM must conduct planning based on the National Security Strategy and National Defense and Military Strategies and must have forces on hand that can respond in a timely fashion to support its requirements. To support these requirements, forces must be stationed in locations that are in a geographic location that is in proximity to the Pacific Theater, or stationing locations must have deployment facilities and logistics capability to support operational needs in the Pacific Theater. Installation stationing locations must be capable of supporting the strategic requirements and contingency plans of PACOM.

3. **Training.** Potential stationing locations must have access to maneuver training areas and the training range capacity required to meet unit doctrinal training standards. Sites considered must have sufficient land for training and maneuver areas for existing and realigned units, and constructing, upgrading, and operating live-fire and qualification ranges as required. Quality and quantity of training land, ranges, and existing training facilities are all considered. Alternatives that are not capable of supporting the training readiness requirements of units to be stationed as part of the Proposed Action have not been carried forward in this document. This document does not consider installations for unit stationing to support the Proposed Action if units will not have access to modernized training ranges or they are not a tier 1 or 2 training installation (See Appendix A). If new ranges are required the installation or its designated training sites must have the space to construct them to maintain its required training proficiency. Unit stationing locations must allow units to train effectively with their higher/lower echelon headquarters, if integrated execution of tactical tasks is required for doctrinal training proficiency. For example, if Army-wide force management decisions recommend that an additional explosive ordnance detachment be integrated into an explosive ordnance company already stationed at an existing installation, these units must be stationed at the same installation if the unit is to achieve mission proficiency.

4. **Quality of Life and Garrison Support Infrastructure.** The current capability for the installation to support Soldiers, Families, and civilians (e.g., Soldier/family medical clinics, maintenance facilities, administrative office space, child and youth development centers, and school systems) is considered. The presence of adequate housing or the ability to construct housing to support Soldiers and their Families must be available on or off-post to support new units stationed at the installation as part of Army growth. Installations without excess housing/facilities capacity in the surrounding community or buildable space to accommodate the garrison requirements of additional units have not been carried forward for analysis if there is not existing capacity to support unit stationing at the installation.

3.5 Application of Screening Criteria to Potential Installation Stationing Locations

The Army initially included all of its installations as potential stationing locations to support growth, transformation, and realignment to support PACOM operations. Stationing of units at overseas locations has not been carried forward as a viable alternative in accordance with national security policy and GDPR recommendations. Additionally, facilities that do not have adequate modernized range facilities and training land have been screened from analysis. Installations that are reserve component installations and do not have permanent party infrastructure or services have also been screened from further consideration. Finally, installations that do not have access to air or sea deployment facilities to support PACOM mission requirements have also been screened from analysis. The Army considered the following stationing locations as viable, active duty, Tier 1 and 2 training installations with deployment capability to support Pacific theater missions. The following installations are the only Army installations that meet the minimum screening criteria for stationing of units under the Proposed Action:

- Fort Irwin, CA
- Fort Polk, LA
- Fort Bragg, NC
- Fort Lewis and Yakima Training Center, WA
- Fort Hood, TX
- Fort Benning, GA
- Fort Bliss, TX
- Fort Drum, NY
- Fort Campbell, KY
- Fort Stewart and Hunter Army Airfield, GA
- Fort Carson and Pinon Canyon Maneuver Site, CO
- USAG Hawai'i (SBMR and Fort Shafter)
- USAG Alaska (Fort Richardson and Fort Wainwright)
- Fort Riley, KS
- Fort Knox, KY
- White Sands Missile Range, NM

Chapter 4 of this document will analyze the potential impacts resulting from implementing the Proposed Action as part of Alternatives 1, 2, and 3. Chapter 4 analyzes various stationing scenarios at installations in Hawai'i and Alaska that are capable of supporting the needs of the Proposed Action. In conjunction with the 2007 analyses assessed in the PEIS, this analysis will assist Army decision-makers in incorporating an assessment of relative environmental impacts resultant from implementing the Proposed Action into the final stationing decision.

3.6 Alternatives Considered but Eliminated from Further Analysis

Permanently Station Significant Numbers of New Units at locations in other Countries:

As part of this alternative, significant numbers of new units would be stationed at overseas locations at US Army bases in allied countries such as Japan or Korea. This alternative would allow the Army to take advantage of additional overseas infrastructure capacity, but it would not adhere to national defense policy or decisions and recommendations put forward in the QDR. Despite the short term construction cost saving to be gained through such an alternative, the Army is engaged in the process of GDPR to bring units back from overseas locations. This process is aligned with Department of Defense strategies to project power abroad from within

1 the United States where Soldiers have increased levels of force protection and access to
2 training resources. While there may be minor adjustments to force structure outside the US and
3 its territories, these installations will not receive significant numbers of new Soldiers.

4
5 **Permanently Station New Units at Locations which do not have Deployment Capability to**
6 **Support PACOM:** This alternative would involve stationing units at locations that do not have
7 deployment facilities to ensure that units are able to support the strategic and operational needs
8 of PACOM. The PACOM area of responsibility covers an extremely large amount of space. To
9 effectively respond to contingencies, units must be stationed at locations with adequate
10 deployment facilities (C-17 deployment capability) to allow PACOM effectively to employ units to
11 meet national security requirements. Units without C-17 air deployment capability have been
12 screened from further analysis.

13
14 **Station Active Duty Units at Reserve Component Sites:** As part of this Alternative, units
15 would be stationed at Reserve component installations to support the Proposed Action. While
16 Reserve component facilities typically possess some of the range infrastructure required to
17 support an Active Duty BCT, the installations' primary mission is to focus on training National
18 Guard and Reserve Component Soldiers to prepare them for deployment to support on-going
19 missions. These installations do not have full time staff or garrison support infrastructure
20 capable of accommodating full time Active component units to be assigned as part of the GTA
21 process. The lack of services and infrastructure for permanent party Soldiers makes this
22 alternative infeasible. Reserve Component installations have therefore been determined to be
23 incapable of meeting the Purpose and Need of the Proposed Action.

24
25 **Station All Required Units Somewhere Other than Alaska or Hawai'i:** Under this scenario,
26 the required Soldiers would be stationed at CONUS locations and could join Hawai'i and
27 Alaska-based units upon deployment. This would not meet the purpose and need for the
28 Proposed Action because it would not allow units to train as they fight as integrated combined-
29 arms teams. It would prevent units from forming the habitual supporting relationships necessary
30 to execute mission essential tasks. In the case of units that need to be augmented by Soldiers
31 with critical skills, the units without those Soldiers at their home station could not fully perform
32 their missions.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

The following section provides information which discusses the affected environment and environmental and socioeconomic impacts (environmental consequences) of the proposed action. Subsections of this chapter divide analyses for potential unit stationing scenarios by installation location. As part of the proposed action (growth and realignment to support operations in the Pacific Theater), units may be stationed at locations in the Continental United States (CONUS), as well. An analysis for stationing of additional units in CONUS to support this action has been completed as part of the Programmatic Environmental Impact Statement (PEIS) that was published in October, 2007. This document is incorporated by reference. The special focus of the analysis presented in this document is on the installations in the Pacific Theater to which the Army may assign 1,000 or more Soldiers. The baseline for the proposed action is considered the installation's baseline condition in Fiscal Year 2008 (FY08) prior to the implementation of growth and realignment to support operations in the Pacific Theater. The baseline condition includes Congressionally-mandated Base Realignment and Closure (BRAC) 2005 and modularity decisions.

Methodology

This Supplemental Programmatic EIS presents a top-tier perspective of stationing actions affecting the U.S. Army Pacific that provides decision-makers, regulatory agencies, and the public with information on the potential environmental and socioeconomic effects resulting from the implementation of Army growth and realignment through different types of unit stationing scenarios. This information will allow the decision-maker to review the proposed alternatives and potential environmental and socioeconomic impacts for implementing Army growth required to support operations in the Pacific Theater, enabling them to make informed decisions when determining final stationing locations.

In addition to locations carried forward in the PEIS, the Army has determined that 4 installations are capable of supporting the proposed action of growing and realigning forces to support operations in the Pacific Theater. These locations are Fort Shafter, HI; Schofield Barracks, HI; Fort Wainwright, AK; and Fort Richardson, AK. The designated training areas utilized by U.S. Army Garrison Alaska (USAG Alaska) and U.S. Army Garrison Hawai'i (USAG-HI) are also carried forward in this chapter for analysis. The Army has and continues to assess its force structure needs to support operations in the Pacific Theater. This document and its analysis of impacts will assist Army force managers in making final stationing decisions. The Army has reviewed its force structure needs for supporting the proposed action and has developed 6 potential stationing scenarios for installations analyzed in this document. Because of ongoing planning and budgeting the exact design and structure of proposed growth and realignment to support operations in the Pacific is yet to be determined. The six unit stationing scenarios were developed to best capture the essence of stationing scenarios and inform Army leadership of their potential impacts. Stationing scenarios include Combat Support (CS) units with approximately 1,000 Soldiers, Combat Service Support (CSS) units with approximately 1,000 Soldiers, Combat Support units having approximately 3,000 Soldiers, Combat Service Support units with approximately 3,000 Soldiers, a Fires Brigade having approximately 1,600 Soldiers, and a Combat Aviation Brigade (CAB) containing approximately 2,800 Soldiers. The Combat Support scenarios would include smaller units of Military Police (MP), Explosive Ordnance Disposal (EOD), and Engineer components. Combat Service Support units provide logistical capability and may be comprised of Transportation, Quartermaster, Headquarters, and Medical functions. The Fires Brigade and Combat Aviation Brigade scenarios are based on the Army

1 Modular Force organization which offers self-sustaining unit capability, equipment, and
2 manning.

3
4 All scenarios are not evaluated at all potential stationing locations, but take into account the
5 capacity of the installation and the Army's force structure management needs. For example,
6 only two scenarios are evaluated at Fort Shafter, HI which looks at impacts of stationing up to
7 1,000 additional Soldiers of CS or CSS units. In addition, the Army has determined that the
8 stationing of a Fires Brigade in Hawai'i is not a scenario that would be analyzed at this time.
9 These scenarios are designed to provide decision-makers with awareness of potential
10 environmental issues and impacts now and in the near future, and should not be interpreted as
11 representing the Army's plan for supporting growth and realignment in the Pacific Theater.
12

13 This Supplemental PEIS (SPEIS) adopts an analytic methodology similar to that used in the
14 PEIS for Army Growth and Force Structure Realignment (October 2007). The PEIS for Army
15 Growth identified several types of activities referred to as "activity groups" that were likely to
16 result in impacts to the environment, the garrison as a whole, and to the communities
17 surrounding the Army installation. These activity groups served as the evaluation elements for
18 use as a planning and decision making tool and were applied for environmental impact analysis
19 process for the six unit stationing scenarios. Those four activity groups include garrison
20 construction, training infrastructure construction, live-fire training, and maneuver training. That
21 methodology has been adapted for use by this SPEIS. Activity groups were coupled with the
22 requirements of each of the six unit stationing scenarios and applied to Valued Environmental
23 Components (VECs) for each of the four Army installations and their designated training areas¹.
24 As part of this supplemental analysis, the Army has reviewed recently completed NEPA
25 documentation and worked with installation staff at each location to determine the requirements
26 for supporting units stationing scenarios. The Army has worked with environmental
27 professionals at its installations to conduct impact assessments based on the information
28 provided by facilities planners and Army training staff. VEC ratings, rated "minimal" to
29 "Significant Adverse") are based on currently available information and the assessment of
30 professional training, facilities master planners and environmental staff. A description of
31 determining the basic significance of effects is found in the following pages. The significance of
32 potential direct, indirect, and cumulative effects is generally determined by evaluating the action
33 and alternatives as it relates to the individual VEC. Because the decision-maker has the
34 flexibility to choose a variety of combinations of units, the determination of significance is best
35 understood at the site-specific level of analysis, when the installation would have the most
36 information available to them regarding specific Soldier unit numbers, facility requirements, and
37 training requirements.
38

¹ Not all of the training areas associated with these installations may be impacted, therefore only those training areas where training is likeliest to occur have been evaluated for potential environmental impacts.

Significance of Effects

In 40 CFR 1508.27 (CEQ regulations), the regulations specify that in determining the significance of effects, consideration must be given to both “context” and “intensity”.

Context refers to the significance of an effect to society as a whole (human and national), to an affected region, to affected interests, or to just the locality.

Intensity refers to the magnitude or severity of the effect, whether it is beneficial or adverse.

The **significance** of potential direct, indirect, and cumulative effects is determined by evaluating the action, alternatives, and proposed mitigation measures as it relates to the individual VEC. The evaluation of significance is typically based on the assumption that the full effect of the proposed condition would occur all at once. More likely, the effects would be less than the maximum predicted and would occur incrementally rather than all at once. Actual effects might be less severe than those predicted.

Legal requirements should be considered in determining significance. Actions that are likely to result in violation of regulatory standards are usually considered to have significant effects.

Air Quality

Two independent legal requirements govern consideration of air quality effects: (1) NEPA and (2) the general conformity provision of Clean Air Act (CAA) Section 176(c), including EPA’s implementation, the General Conformity Rule. Depending on the action and the air quality conformity attainment status of the installation (or other affected property), an installation might have to complete a separate conformity analysis in addition to the NEPA analysis. Applicability of the two requirements must be considered separately. Exemption from one requirement does not automatically exempt the action from the other requirement, nor does fulfillment of one requirement constitute fulfillment of the other.

Some example air quality environmental effects include:

- Changes in the type or amount of air emissions due to changes in the operation of current air pollution sources or the addition of sources
- Changes in air emissions due to construction activities (vehicular emissions and fugitive dust).
- Changes in local/regional ambient air quality due to changes in emissions.
- Potential exposure to asbestos during building demolition/renovation (if asbestos has not been removed prior to demolition/renovation)
- Changes in public opinion (favorable or adverse) due to projected changes in air quality, especially for incinerator projects
- Effects on compliance status due to construction or modification of emission sources.
- Effects on the timely attainment or maintenance of the National Ambient Air Quality Standards (NAAQS) or any air quality standard or milestone contained in the State Implementation Plan (SIP) or Federal Implementation Plan (FIP)
- Downwind effects, particularly any that might disproportionately affect low-income or minority populations.

NOTE: Consider fugitive dust emissions. Determine if the action increases the levels of fugitive dust in a manner that exceeds limits of particulate matter (PM) in nonattainment areas or result in other potential adverse effects.

SIGNIFICANCE

An alternative could have a significant air quality effect if it would result in substantially higher air pollutant emissions or cause air quality standards to be exceeded.

Examples of significance criteria for air quality include:

- Source-specific emission limits
- Permitting and licensing requirements
- NAAQS
- State or local ambient air quality standards
- *De minimus* emissions levels outlined in the General Conformity Rule
- SIPs/FIPs
- Exposure of sensitive populations to pollutants
- Any other applicable regulations or standards

Air Space

The Federal Aviation Administration (FAA) manages all airspace within the U.S. and the U.S. territories. Airspace is defined in vertical and horizontal dimensions and also by time. The FAA recognizes the military's need to conduct certain flight operations and training within airspace that is separated from that used by commercial and general aviation. Airspace is a finite resource and must be managed to achieve equitable allocation among commercial, general aviation, and military needs.

The FAA has established various airspace designations to protect aircraft while operating near and between airports and while operating within airspace identified for defense-related purposes. Flight rules and air traffic control procedures govern safe operations within each type of designated airspace. Most military operations are conducted within designated airspace and follow specific procedures to maximize flight safety for both military and civil aircraft.

Controlled airspace is a generic term for the different types of airspace (Classes A, B, C, D, E, and G airspace) and defined dimensions within which air traffic control service is provided to instrument flight rules flights and visual flight rules flights in accordance with the airspace classification.

Army airfield Air Installation Compatible Use Zones (AICUZ), Clear Zones, and Accident Potential Zones (APZ) represent components to be considered with respect to air space and land use compatibility. AICUZ identifies noise levels specifically associated with aircraft operations. Clear Zones and APZ are based on areas having statistically higher potential for aircraft accidents and are often areas that typically are subjected to high levels of aircraft noise. Such areas should remain undeveloped for safety purposes.

SIGNIFICANCE

Analysis of airspace management and use involves considering many factors, including types, locations, and frequencies of aerial operations; the presence or absence of already designated (controlled) airspace; and the amount of air traffic using or transitioning through a given area. Proposed actions that are consistent with controlled airspace designations should typically be found not to present impacts on safety. Proposals for actions potentially inconsistent with airspace designations or that may pose a threat to the safety of other aircraft or persons or property require careful consideration, which often involves coordination with FAA officials. Where safety is a concern, the proponent should consult with the military representative at the FAA's regional field office.

Cultural Resources

Impact assessment for cultural resources focuses on those properties which are listed in or are considered eligible for the National Register of Historic Places or are National Historic Landmarks, as well as resources that are considered sensitive by Native American groups. Based on statutory requirements, cultural resources for NEPA analyses should be considered to include:

- historic properties, as defined in the National Historic Preservation Act (NHPA) (Section 106 compliance),
- cultural items, as defined in the Native American Graves Protection and Repatriation Act (NAGPRA);
- archeological resources, as defined in the Archeological Resources Protection Act (ARPA);
- historic and prehistoric resources, as defined in the Antiquities Act;
- sites that are scientifically significant, as defined by the Archeological and Historic Data Preservation Act (AHPA);
- sacred sites, as defined in Executive Order 13007, to which access is provided under the American Indian Religious Freedom Act (AIRFA); and
- collections, as defined in 36 CFR Part 79, Curation of Federally-Owned and Administered Collections

Impacts to cultural resources should include the following types of information:

- Statement of eligibility of archeological or historic structures in the project area that are on or potentially eligible for the National Register
- If historic properties are in the Area of Potential Effect (APE), follow criteria in 36 CFR 800.9(a) to determine of the potential effect on these properties. Effects may include, but are not limited to:
 - Destruction of historic buildings, structures, or landscapes
 - Construction in historic districts
 - Repair or alteration of historic buildings and structures
 - Construction in areas with archeological sites
 - Transfer of ownership to non-federal entities
 - Decreased maintenance resulting in deterioration of historic buildings and structures
 - Changes of mission training in range areas that could result in damage to surface or buried archeological sites
- Determination of effect for the proposed action should be made in consultation with the installation's Cultural Resources Specialist and the State Historic Preservation Office (SHPO).
- Actions or mitigation measures that were completed or will be necessary to bring the facility into compliance with NHPA.

SIGNIFICANCE

An alternative could have a significant effect on cultural resources if it would:

- result in unauthorized artifact collecting or vandalism of identified important sites;
- modify or demolish an historic building or environmental setting; or

- promote neglect, resulting in resource deterioration or destruction, audio or visual intrusion, or decreased access to Native American resources.

Noise

In preparing NEPA analyses of proposed actions, it is important to quantify noise levels (when data are available) and to describe the noise environment in qualitative terms. Environmental noise analyses include a description of the installation's existing and proposed noise environment resulting from all sources, including weapon firing, detonation of explosives, aircraft, vehicles, and other noise-producing equipment (e.g., generators, heating ventilation/air conditioning equipment).

In general, the military noise environment consists of three types of noise:

- transportation noise from aircraft and vehicle activities,
- high-amplitude noise from armor and artillery firing and demolition operations, and
- noise from firing at small arms ranges.

Noise may be intermittent or continuous, steady, or impulsive. Human response to noise is extremely diverse and varies according to the type of noise source, the sensitivity and expectations of the receptor, the time of day, and the distance between the source and the receptor. The decibel (dB) is the accepted unit of measurement for noise level. The A-scale decibel (dBA) is an adjusted dB that corresponds to the range of normal human hearing.

A tool that assists in the analysis for noise producing activities is the Environmental Noise Management Program (ENMP) (see Chapter 7 of AR 200-1). The goals of ENMP are to protect the human health and welfare of people on an off post affected by Army-produced noise and to reduce community annoyance from environmental noise. The program seeks to achieve compliance with applicable noise regulations in a manner consistent with an installation's mission.

As a part of the ENMP, noise contour maps are prepared. The maps delineate up to three different noise zones, which are based on the expected percentage of the population that would be highly annoyed by environmental noise. The associated noise levels for each zone are shown below.

Noise Zone	Population Highly Annoyed	Transportation Noise (ADNL)	Impulsive Noise (CDNL)	Small Arms Noise (unweighted)
Zone I	< 15%	< 65 dBA	< 62 dBC	< 87 dBP
Zone II	15% - 39%	65-75 dBA	65-70 dBC	87-104 dBP
Zone III	> 39%	> 75 dBA	> 70 dBC	> 104 dBP

DNL – Day-night level (accepted unit for quantifying human annoyance to general environmental noise). The time-weighted energy average sound level, over a 24-hour period, with a 10-decibel (dB) penalty added to the nighttime levels (between 2200 and 0700 hours).
 ADNL – A-weighted day-night level (from sources such as vehicles and aircraft and from continuous sources such as generators)

CDNL - C-weighted day-night level (high energy blast noise and other low-frequency sounds capable of inducing vibrations in buildings or other structures (e.g., armor, artillery, and demolition activities))
dBP – decibels, unweighted

In general, noise-sensitive land uses, such as housing, schools, and medical facilities, are compatible with the noise environment in Zone I, normally incompatible in Zone II, and incompatible in Zone III.

Examples of Army projects that may require supplemental noise assessments are needed include adding or expanding a firing range, airfield, industrial operation, or maneuver area. The need for additional noise assessment may arise:

- Where the noise environment is determined by a few infrequent noises at very high levels (e.g., blasts with C-weighted sound exposure levels in excess of 110 dB).
- If single-even noise levels from a proposed action are greater than the existing levels by 10 dB or more.
- In areas where the ADNL is between 60 and 65 dB and the proposed action is projected to increase the DNL by 3 dB or more.
- In areas where the ADNL is above 65 dB and the proposed action is projected to increase the DNL by 1.5 dB or more

SIGNIFICANCE

An alternative could have a significant noise effect if it would generate new sources of substantial noise, increase the intensity or duration of noise levels to sensitive receptors, or result in exposure of more people to high levels of noise.

Soil Erosion

NOTE: Consider Prime Farmland in Soils section

Prime Farmland. The Farmland Protection Policy Act (FPPA) of 1981 protects prime or unique farmlands as defined in the Act or farmland that is determined by the appropriate state or unit of local government agency or agencies with concurrence of the Secretary to be farmland of statewide or local importance.

The purpose of FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses and to ensure that federal programs are administered in a manner that, to the extent practicable, is compatible with state, local government, and private programs and policies to protect farmland.

The NEPA analysis should state whether any of the mapped soil units are prime farmland. If they are, they maybe protected under FPPA. For many analyses, particular inquiry is needed to determine prime farmland classification. In some instances, a soil series designated as prime farmland soil will be present at the project site, but because of previous land disturbances or facilities development, the soil is no longer viable for agricultural production. Analysis should indicate what areas of the project site could experience a temporary or permanent loss of prime farmland, whether completion of a Farmland Conversion Impact Rating would be necessary, and, if the farmland was to be restored, when and how it would be done.

Soils. Soils refer to the upper layer of unconsolidated material on the surface of the earth that is capable of supporting plant life. The National Cooperative Soil Survey is responsible for developing and implementing standards for describing, classifying, mapping, writing, and publishing information about the soils of a specific area and for presenting this information in soil surveys.

Any new construction will disturb soils through ground-breaking excavation, removal of vegetation, and leveling and grading of the surface. The exposed soil would be exposed to erosion that could lead to deposition of sediment in nearby water bodies if proper management measures are not implemented. If topsoil is removed, the ground should be covered or stabilized with vegetation to prevent wind or water erosion. The soil must be replaced as the top ground cover; otherwise, there will be no material to support vegetation, creating a barren surface and the potential for severe erosion.

Certain soils have characteristics that could make them unsuitable for construction. A high acidic level can lead to corrosion of underground pipes and storage tanks. Soil exhibiting high plasticity may also be unsuitable for supporting structures such as buildings, parking lots, and roads because of their high shrink/swell potential.

The construction of new buildings, roads, and parking lots also increases the amount of impervious surface in the vicinity of the project site. The effect may be an increase in storm water runoff, resulting in erosions and associated sedimentation. Increased sediment loads in runoff can affect the water quality of nearby water bodies.

Assessing the proposed project's potential impacts on geology and soils and the impacts of geology and soils (including prime farmland soils) on the proposed project requires consideration of a broad spectrum of possible effects and relies on the accuracy of the data and the specificity relative to the project site. Having detailed, site-specific geologic and soil information for a construction project is not only recommended, but may be required by state or local regulations.

Impact analyses for geology and soils should accomplish the following objectives:

- Indicate where subsurface geology is not suitable for a foundation for buildings, parking lots, and other structures due to possible subsidence, seismic activity, or high shrink/swell potential
- If the area is seismically active, indicate the Seismic Zone building code rating that would need to be met to reduce the potential for harm to human life
- Indicate areas where soils would be disturbed, especially areas with severe erosion potential, and what management measures would be applied to control or reduce erosion.

Consider two types of effects – effects of the project on the geology and soils of the site, and effects of the geology of the site on the project.

Effects of the proposed project on geology and soils could include:

- Erosion. Any construction activity that alters the microtopography through gradation, leveling, and excavation leaves the soil exposed and subject to wind and water erosion by removing vegetative cover. An increase in the suspended dust due to trucks and other construction vehicles driving over the exposed ground surface also can be expected.

- Sediment deposition. Soil disturbance can contribute to sedimentation in adjacent water bodies through erosion and dust suspension. Sedimentation can smother vegetation, alter the flow of water, and ultimately decrease water quality.
- Increase in impervious surfaces. Construction of new buildings and the parking lots and roads that service them increases the acreage of impervious surfaces. This leads to increased storm water runoff and may affect water quality.
- Loss of mineral resources. Building of new housing units over mineral deposits would result in the loss of access to those resources, and therefore a possible economic loss to the Region of Influence (ROI).

Effects of geology and soils on the proposed project could include:

- Subsidence. Ground subsidence due to caves, sinkholes, and other karstic features or underground mines could result in severe structural damage.
- Seismic activity. Earthquake activity could result in structural damage and harm to human life.
- Shrink/Swell. Soils with high shrink/swell potential could result in damage to the foundation of buildings, as well as to roads and parking lots.

SIGNIFICANCE

If the proposed action would result in an extensive loss of prime farmland acreage relative to the total amount of prime farmland in the region, a significant impact may result. Avoidance of development on prime farmland represents the best mitigation approach.

If an alternative would result in an increased geologic hazard or a change in the availability of a geologic resource, it could have a significant effect. Such geologic and soil hazards would include, but not be limited to, seismic vibration, land subsidence, and slope instability.

If a proposed project were to be built in an area where the geologic or soil conditions exhibit such severe engineering limitations that significant adverse impacts to structural integrity could arise, the situation could potentially lead to the preparation of an EIS. Such limitations could include the presence of soils with a high shrink/swell potential and the potential for ground subsidence.

Biological Resources

The description of biological resources should emphasize those biological resources which are expected to be affected by the action under consideration or that have particular significance on local, regional, or nation level. Issues specifically addressed under the topic of biological resources include vegetation, fish and wildlife, sensitive species, sensitive habitats, and wetlands.

The following statutes impose specific regulatory requirements pertaining to the treatment of biological resources on federal property.

- AR 200-3 (Natural Resources-Land, Forest and Wildlife Management)
- Endangered Species Act
- Migratory Bird Treaty Act
- Sikes Act
- Fish and Wildlife Coordination Act of 1980
- Bald and Golden Eagle Protection Act
- Magnuson-Stevens Fisheries Management and Conservation Act
- Marine Mammal Protection Act

Section 7 of the Endangered Species Act requires federal agencies to coordinate with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to ensure that any proposed action that the agency authorizes, funds, or carries out is not likely to result in adverse impacts on threatened or endangered species or critical habitats. NMFS has jurisdiction over marine fish, anadromous fish, sea turtles, and marine mammals. Consultation, conference, and biological assessment procedures under Section 7 should be integrated with NEPA procedures to the maximum extent feasible. It is strongly recommended that the Section 7 process be completed and the results incorporated into the final NEPA document before release of a FNSI or ROD.

Evaluating potential impacts on biological resources involves two aspects—assessing impacts on resources affected by the proposed action and identifying the circumstances and environmental conditions under which the impacts would be significant. Because of the lack of quantitative models applicable to this process, much of the assessment is qualitative in nature and relies primarily on the expertise and judgment of the assessor(s). Arguably, the element most critical to the analysis, however, is the dialogue between the Army and federal and state consultation agencies. The agencies provide information on sensitive species and habitats located on the installation or in the vicinity of the project site and can inform the Army, early in the NEPA process, as to whether the proposed action is consistent with the requirements of the Endangered Species Act.

For each alternative, the environmental impact analysis section for biological resources should present the following information:

- The vegetation, fish and wildlife, sensitive species, and sensitive habitats that would be permanently lost as a result of the proposed action.
- The biological resources that would be temporarily lost and when and how those resources would be restored.
- Disturbances to biological resources, terrestrial wildlife species in particular, that would occur during and/or following implementation of the proposed action.
- The outcome of the information consultation process between the Army and the U.S. Fish and Wildlife Service/National Marine Fisheries Service
- The outcome of informal consultation process between the Army and state natural resource agencies
- Mitigation measures to offset the loss of vulnerable biological resources, including how and when those measures would be accomplished.

In the case of an adverse effect, the requirement can often be avoided by mitigation proposals to alter the location or timing of the project. However, the mitigation proposals must be suggested or approved by the U. S. Fish and Wildlife Service/National Marine Fisheries Service and/or appropriate state agency.

SIGNIFICANCE

The effect of an alternative on biological resources and ecosystems could be significant if it would disrupt or remove any endangered or threatened species or its habitat, its migration corridors, or its breeding areas. The loss of a substantial number of individuals of any plant or animal (sensitive or non-sensitive species) that could affect the abundance or diversity of that species beyond normal variability could also be considered significant. The measurable degradation of sensitive habitats, particularly wetlands, could be significant.

Wetlands

Wetlands are defined by EPA and USACE as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Areas meeting this definition are delineated based on parameters of vegetation, soils, and hydrology.

Section 404 of the Clean Water Act is widely accepted as the most significant federal program affecting the protection of wetlands. This program regulates both the discharge of dredged and fill materials into waters of the United States and the conversion of wetlands to uplands for farming or forestry. Another federal mandate regulating wetlands is Executive Order 11990, Protection of Wetlands, which requires federal agencies not only to minimize the destruction of wetlands, but also to initiate action to enhance their natural values.

If the presence of a wetland is suspected in the area and the wetland is likely to be affected by the proposed action, the proponent must have the wetland boundaries delineated before undertaking any action. Delineations can be performed by certified or otherwise qualified persons who must submit their results to USACE for approval.

A wetland area subject to permanent loss from fill should be precisely quantified by conducting field delineation, survey, and mapping of all potentially effected waters of the United States, including wetlands. A qualitative consideration of other categories of wetland related impacts is usually sufficient. Analytical models are available to generate quantitative estimates of changes in wetland hydrology and changes in wetland function. Typical categories of wetland impacts from Army activities include:

- Filling
- Flooding
- Draining
- Sedimentation
- Water quality degradation
- Increased noise and human activity

NOTE: Of the categories listed above, only filling is directly subject to permitting requirements under federal law. However, all potential impacts on wetlands must be considered under NEPA, not just impacts requiring permits.

SIGNIFICANCE

Net loss of wetland areas or functions as a result of implementation of an Army proposal may be deemed a significant impact. Because wetland area is more readily quantified than wetland function, and because the success of restored or created wetlands is uncertain, most mitigation proposals call for restoring or creating more wetland area than lost. Sample mitigation measures include:

- Use of detention basins, oil/water separators, and other storm water management structures
- Used of vegetated buffers, silt fences, straw mulches, and other erosion control practices during construction
- Restoration of wetlands disturbed by the project
- Restoration of other wetlands
- Creation of other wetlands
- Enhancement of other wetlands
- Purchase and protection of other wetlands
- Monetary compensation.

Water Resources

Water resources can be divided between surface and ground water sources.

SURFACE WATER. Surface water is often used to describe various bodies of water residing or flowing into basins, channels, and other various natural and artificial landforms found on the earth's surface. Examples of surface waters include rivers, streams, lakes, reservoirs, ponds, and estuaries. Surface water resources have many beneficial uses including drinking water supply, primary contact recreations (e.g., swimming), and aquatic life support.

Acceptable or unacceptable water quality in surface waters is usually judged using water quality standards established by states or other relevant jurisdictions. Most standards assign a beneficial use to a water body (i.e., water quality classification) and then set minimum numeric and narrative criteria needed to support that use.

Any action involving surface disturbance in the watershed (e.g., establishment of new facilities complexes, expansion of existing complexes, or installation of new utilities serving those complexes) may have direct impacts on hydrology or water quality of surface water. Demolition and replacement of existing Army facilities, even when the developed area is not expanded, could also potentially result in temporary or permanent changes in surface water conditions.

A region of influence for surface waters would typically include the sites for construction of other activities for each alternative plus adjacent lands where surface waters could be influenced by drainage patterns and point and non-point pollution. Professional judgment is necessary to estimate the extent of adjacent lands that must be considered.

The federal Clean Water Act of 1977 (33 USC 1251, et. seq.) is the primary law regulating water pollution in surface waters. Other relevant laws and regulations are listed below:

- AR 200-1, Environmental Protection and Enhancement
- AR 420-49, Utility Services
- Safe Drinking Water Act (SDWA)
- Marine Protection, Research, and Sanctuaries Act
- Estuary Protection Act

Assessing potential impacts on surface waters relies heavily on the specialized expertise and judgment of the assessor. Construction activities can produce many different kinds of non-point source pollutants that, if allowed to migrate into surface waters, can cause harmful consequences and lower water quality. Best management practices are used to prevent, or at least control, the pollution of runoff water that moves diffusely into surface water bodies.

Typical categories of water resource impacts from Army activities include the following:

- **Sedimentation.** Surface disturbances can lead to increased erosion and the movement of sediment to surface waters. Sedimentation builds up the streambed, increases turbidity, and covers up habitat important for fish spawning and aquatic insect life.

- **Water quality degradation.** Demolition and construction activities often require the use of toxic or hazardous material such as petroleum products, pesticides, herbicides, and sealants. If

1 allowed to migrate to water bodies as non-point source pollution, these materials can lower
2 water quality and harm plant and animal life.

3
4 **- Flooding.** Surface disturbances can alter drainage patterns and render soils more
5 impervious. These conditions can increase both the volume and intensity of runoff, which in
6 turn increases flooding and causes erosion of stream channels and banks.

7 SIGNIFICANCE

8 Violations of water quality standards are normally deemed significant impacts.

9 If an alternative would result in a reduction in the quantity or quality of water resources for
10 existing or potential future uses, it could have a significant effect. Based on existing water
11 rights, a significant effect would occur if the demand exceeded the capacity of the potable water
12 system. An alternative also could have a significant effect on water resources if it would cause
13 substantial flooding or erosion, if it would subject people or property to flooding or erosion, or if it
14 would adversely affect a significant water body, such as a stream or lake.

15
16
17 In most cases storm water management practices are used to mitigate the effects of
18 construction sites (and other kinds of activities, as well) on surface water resources. While
19 these practices vary in purpose and design, their general objectives include:

- 20 ■ Minimizing the amount of disturbed soil
- 21 ■ Preventing runoff from off-site across the site
- 22 ■ Slowing down the runoff flowing across the site
- 23 ■ Removing sediment from on-site runoff before it leaves the site.

24
25 Examples of practices used to meet these objectives include the installation of silt fencing,
26 sediment basins, hay bales, and gradient terraces.

27
28 **GROUNDWATER.** Groundwater occurs in an aquifer, a water-bearing bed, or a stratum of
29 earth, gravel, or porous stone.

30
31 Any action involving surface disturbance, such as the establishment of new facilities, may have
32 direct impacts on the hydrology or water quality of groundwater. A region of influence for
33 groundwater would typically include construction sites or other activity locations for each
34 alternative, plus adjacent lands where recharge and discharge of groundwater occurs.

35
36 The Safe Drinking Water Act (40 USC 100, et. seq.) directs EPA to develop national drinking
37 water regulations for public water systems and directs states to establish programs that protect
38 areas around wellheads. The 1996 amendments establish a strong emphasis on source water
39 protection and enhanced water system management.

40
41 Construction activities can produce many different kinds of non-point source pollutants, which, if
42 allowed to migrate to groundwater, can cause harmful consequences and lower water quality.
43 Best management practices are designed to prevent, or at least control, the pollution of runoff
44 water.

45
46 Typical categories of groundwater impacts from Army activities include:

- 47 ■ Groundwater quality degradation. Demolition and construction activities often require
48 the use of toxic or hazardous materials such as petroleum products, pesticides,
49 herbicides, and sealants. If allowed to migrate to groundwater, they can lower water
50 quality.

- Decreased aquifer recharge. Surface disturbances can alter drainage patterns and render soils more impervious. These conditions can increase surface runoff at the expense of groundwater recharge. These conditions could lower the water table and alter discharge sites.

SIGNIFICANCE

Violations of water quality standards are normally deemed significant impacts. In most cases, storm water management practices are used to mitigate the effects of construction sites (and other kinds of activities, as well) on surface water resources.

Examples of practices used to meet these objectives include careful handling of hazardous materials, marking and specialized protection of groundwater recharge areas, and the installation of runoff devices and structures as silt fencing, sediment basins, hay bales, and gradient terraces.

Facilities

Principal elements of facilities include:

- Water systems – systems that provide water for potable use, industrial applications (including fire suppression), and agricultural irrigation. Concerns related to water systems typically pertain to availability and quality of water supplies, treatment processes, distribution, and consumption rates.
- Wastewater systems – systems that may treat sanitary sewer, industrial, or both kinds of wastes. Concerns typically pertain to the age of the system (either its collection system and infiltration/inflow problems or the treatment plant itself), the capacity of a treatment plan (usually expressed in millions of gallons per day), and a treatment plant's record of violations or NPDES permit effluent exceedances.
- Storm Water Systems – systems that convey precipitation away from developed sites to appropriate receiving surface waters. Failure to appropriately size storm water systems to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding. As a general rule, a higher density of development, such as that found in the cantonment areas of Army installations, requires a greater degree of storm water management because of the higher proportion of impervious surfaces in such developed areas.
- Solid Waste Management – systems that involve concerns about the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal may involve waste-to-energy programs or incineration.
- Communications Systems – systems consisting primarily of radio and telecommunications equipment.

SIGNIFICANCE

Where facilities are inadequate, the proponent may initially find a significant impact. In this case, further inquiry may be appropriate, such as concerning the possible necessity of new capital investment. In other cases, a proponent may establish that effects to facilities may be temporary. This often happens where a proposal will involve a surge of personnel within a limited geographic area, imposing abnormal strain on facilities systems. In many instances, these types of surge issues can be adequately addressed in planning, which mitigates the impacts of the proposal.

SIGNIFICANCE

An alternative could have a significant effect on facilities if it would increase demand over capacity, requiring a substantial system expansion, or if it would result in substantial system deterioration over the current condition.

Energy Demand/Energy Generation

Types of energy include electrical power, natural gas, fuel oil, and steam. Army installations use all of these forms of energy. Concerns regarding energy can extend to selection of type, conservation measures, availability, costs, or consumption rates.

SIGNIFICANCE

As with facilities, the capacity and the condition of the energy system prior to and the result of the proposal upon implementation will determine the level of significance. An alternative could have a significant effect on energy demand/generation if it would increase demand over capacity, requiring a substantial system expansion, or if it would result in substantial system deterioration over the current condition.

Land Use Conflict/Compatibility

Land use refers to human use of the land for economic production; for residential, religious, recreational, or other purposes; and for natural resource protection. Land uses are regulated by management plans, policies, zoning ordinances, and regulations that determine the types of uses allowable. These schema also serve to protect specially designed or environmentally sensitive uses.

SIGNIFICANCE

Army actions sometimes have the potential to change the land use of a site, particularly if facilities are constructed in an areas where facilities did not previously exist or if new types of activities are introduced to an area. Such changes in land use can raise a number of issues and concerns, such as whether facilities or activities will be compatible with adjoining land uses on and off the installation. Specific concerns include noise and visual intrusion, exposure to health and safety hazards, increased traffic congestion, changes in property values, community cohesiveness, and protection of environmentally sensitive areas.

The significance of impacts is based on whether the proposed action conflicts with established land uses in the area, disrupts or divides established land use configurations, represents a substantial change in existing land uses, or is inconsistent with adopted land use plans. If an alternative would conflict with adopted plans and goals of the community or if it would result in a substantial alteration of the present or planned land use of an area, it could have a significant direct effect. If an alternative would result in substantial new development or prevent such development elsewhere, it could have a significant indirect effect.

Mitigation measures for changes in land use might include moving a proposed action to a different location to avoid conflicts with adjacent land uses, obtaining a land use plan change where the proposed action is inconsistent with existing land use or zoning maps, and creating open space or other physical buffers at the periphery to reduce perceived conflicts.

Hazardous Material/Hazardous Waste

Based on regulatory definitions, substances are hazardous materials prior to and during their use. After their use and when they are no longer needed, hazardous materials may become hazardous wastes.

SIGNIFICANCE

One method to determine significance of impacts is the use of, or reference to, standards and criteria.

Any impact resulting from the proposed action and alternatives that results in increases to the constituent concentration from levels below to levels above the standards, criteria, or risk thresholds may be considered a significant impact. Actions could also result in significant effects if they result in substantial increases in the generation of hazardous wastes or place substantial restrictions on property use due to hazardous waste, materials, or site remediation.

For example, an alternative could have a significant effect if it would result in a substantial increase in the generation of hazardous substances, increase the exposure of persons to hazardous or toxic substances, increase the presence of hazardous or toxic materials in the environment, or place substantial restrictions on property use due to hazardous waste, materials, or site remediation.

NOTE: An alternative could have a significant impact to human health and safety if it would expose field training units to unexploded ordnance without proper protection. In addition, significant impacts would occur if an alternative resulted in environmental health risks or safety risks specifically to children.

Traffic and Transportation. An alternative could have a significant effect on traffic if it would increase the volume of traffic beyond the existing road capacity, cause parking availability to fall below minimum local standards, or require new or substantially improved roadways or traffic control systems.

Socioeconomics

SIGNIFICANCE

If an alternative would alter substantially the location and distribution of the population within the geographic "region of influence" cause the population to exceed historical growth rates, or substantially affect the local housing market and vacancy rates, the effect could be significant. In addition, an alternative could have a significant effect if it would create a need for new or increased fire or police protection, or medical services, beyond the current capability of the local community.

Environmental justice: Significant effects could occur if an alternative would disproportionately affect minority or low-income populations.

NOTE: Per 40 CFR 1508.14 (CEQ regulations), social or economic effects are not intended by themselves to require the preparation of an EIS. Only when social or economic effects occur with natural or physical environmental effects from the same proposed action will all of these effects be analyzed as part of the NEPA process.

VEC Impact Ratings

The assessment for each installation and their designated training areas is offered in Tables 4.0-1 through 4.0-6 below. The assessment has been conducted for stationing scenarios which could apply to a given installation. The following is a basic description of VEC ratings:

These ratings assess the composite intensity of impacts to the installation by individual VEC resulting from i) cantonment construction, ii) training infrastructure construction, iii) live-fire training, and iv) maneuver training associated with each of the stationing scenarios.

While there are variations in the impacts from each of the unit stationing scenarios to the installations identified, generally, the broad comparison of these impacts demonstrates patterns of expected impacts from each of the stationing scenarios.

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

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3**Table 4.0-1. Combat Service Support Scenario Summary of Potential Effects (1,000 Soldiers)**

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	⊙	⊙	⊙	⊙	⊗	○
Airspace	○	○	○	○	○	○
Cultural Resources	⊗ ⊙	⊙	⊙	⊗	⊗	⊙
Noise	⊙	○	⊙	⊙	⊙	⊙
Soil Erosion	⊙	⊙	⊙	⊙	⊙	○
Biological Resources	○	⊙ ⊗	⊙	⊗	○	○
Wetlands	○	○	○	○	⊗	⊙
Water Resources	⊙	⊙	⊙	⊙	⊙	⊙
Facilities	○	⊗	○	⊗	⊗	○
Energy Demand / Energy Generation	⊙	⊗	○	○	⊗	○
Land Use Conflict / Compatibility	⊙	⊗	⊙	⊙	⊗	○
Hazardous Material / Hazardous Waste	○	⊙	⊙	⊙	⊗	○
Traffic and Transportation	⊗ ⊙	⊗	⊙	⊙	⊙ ⊗	○
Socioeconomics	⊗ ⊙	⊙	⊙	⊙	⊗ ⊗	○

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

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3**Table 4.0-2. Combat Support Scenario Summary of Potential Effects (1,000 Soldiers)**

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	⊙	⊙	⊙	⊙	⊗	⊙
Airspace	⊙	⊙	⊙	⊙	⊙	⊙
Cultural Resources	⊗ ⊙	⊙	⊙	⊗	⊗	⊙
Noise	⊗	⊙	⊙	⊙	⊙	⊙
Soil Erosion	⊙	⊙	⊙	⊙	⊙	⊙
Biological Resources	⊙	⊙ ⊗	⊗	⊗	⊙	⊙
Wetlands	⊙	⊙	⊙	⊙	⊗	⊙
Water Resources	⊙	⊙	⊙	⊙	⊙	⊙
Facilities	⊙	⊗	⊙	⊗	⊗	⊙
Energy Demand / Energy Generation	⊙	⊗	⊙	⊙	⊗	⊙
Land Use Conflict / Compatibility	⊙	⊗	⊙	⊙	⊗	⊙
Hazardous Material / Hazardous Waste	⊙	⊙	⊙	⊙	⊗	⊙
Traffic and Transportation	⊗ ⊙	⊗	⊙	⊙	⊙ ⊗	⊙
Socioeconomics	⊗ ⊙	⊙	⊙	⊙	⊗ ⊗	⊙

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

⊙ = Minor or No Impact

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3**Table 4.0-3. Fires Brigade Scenario Summary of Potential Effects (1,600 Soldiers)**

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	N/A	N/A	N/A	⊙	⊗	○
Airspace	N/A	N/A	N/A	○	○	○
Cultural Resources	N/A	N/A	N/A	⊗	⊗	⊙
Noise	N/A	N/A	N/A	⊙	⊙	⊙
Soil Erosion	N/A	N/A	N/A	⊙	⊙	○
Biological Resources	N/A	N/A	N/A	⊗	⊙	⊙
Wetlands	N/A	N/A	N/A	○	⊗	⊙
Water Resources	N/A	N/A	N/A	⊙	⊙	⊙
Facilities	N/A	N/A	N/A	⊗	⊗	○
Energy Demand / Energy Generation	N/A	N/A	N/A	○	⊗	○
Land Use Conflict / Compatibility	N/A	N/A	N/A	⊗	⊗	○
Hazardous Material / Hazardous Waste	N/A	N/A	N/A	⊙	⊗	○
Traffic and Transportation	N/A	N/A	N/A	⊙	⊙ ⊗	○
Socioeconomics	N/A	N/A	N/A	⊙	⊗ ⊗	○

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

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3**Table 4.0-4. Combat Aviation Brigade Scenario Summary of Potential Effects (2,800 Soldiers)**

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	⊗	N/A	⊗	N/A	N/A	N/A
Airspace	⊙	N/A	⊙	N/A	N/A	N/A
Cultural Resources	⊗ ⊙	N/A	⊙	N/A	N/A	N/A
Noise	○	N/A	⊗	N/A	N/A	N/A
Soil Erosion	⊗	N/A	⊙	N/A	N/A	N/A
Biological Resources	⊗	N/A	⊗	N/A	N/A	N/A
Wetlands	○	N/A	○	N/A	N/A	N/A
Water Resources	⊗	N/A	⊙	N/A	N/A	N/A
Facilities	⊗ ⊙	N/A	○	N/A	N/A	N/A
Energy Demand / Energy Generation	⊙	N/A	○	N/A	N/A	N/A
Land Use Conflict / Compatibility	⊗ ⊙	N/A	⊙	N/A	N/A	N/A
Hazardous Material / Hazardous Waste	○	N/A	⊙	N/A	N/A	N/A
Traffic and Transportation	⊗ ⊙	N/A	⊙	N/A	N/A	N/A
Socioeconomics	⊗ ⊙	N/A	⊙	N/A	N/A	N/A

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

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Table 4.0-5. Combat Service Support Scenario Summary of Potential Effects (3,000 Soldiers)

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	⊙	N/A	⊖	⊙	⊗	○
Airspace	○	N/A	○	○	○	○
Cultural Resources	⊖ ⊙	N/A	⊙	⊖	⊖	⊙
Noise	⊖	N/A	⊙	⊙	⊙	⊙
Soil Erosion	⊖	N/A	⊙	⊙	⊙	○
Biological Resources	⊖	N/A	⊖	⊖	⊙	○
Wetlands	○	N/A	○	○	⊖	⊙
Water Resources	⊖	N/A	⊙	⊙	⊙	⊙
Facilities	⊙	N/A	○	⊗	⊖	○
Energy Demand / Energy Generation	⊙	N/A	○	○	⊖	○
Land Use Conflict / Compatibility	⊖ ⊙	N/A	⊙	⊖	⊖	○
Hazardous Material / Hazardous Waste	○	N/A	⊙	⊖	⊖	○
Traffic and Transportation	⊖ ⊙	N/A	⊙	⊗	⊙ ⊖	○
Socioeconomics	⊖ ⊙	N/A	⊙	⊖	⊖ ⊗	○

⊗ = Significant Adverse

+ = Beneficial Impact

⊖ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

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Table 4.0-6. Combat Support Scenario Summary of Potential Effects (3,000 Soldiers)

VEC	Location					
	Schofield Barracks	Fort Shafter	Pohakuloa Training Area	Fort Richardson	Fort Wainwright	Donnelly Training Area
Air Quality	⊙	N/A	⊖	⊙	⊗	○
Airspace	○	N/A	○	○	○	○
Cultural Resources	⊖ ⊙	N/A	⊙	⊖	⊖	⊙
Noise	⊖	N/A	⊙	⊙	⊙	⊙
Soil Erosion	⊖	N/A	⊙	⊙	⊙	○
Biological Resources	⊖	N/A	⊖	⊖	⊙	○
Wetlands	○	N/A	○	○	⊖	⊙
Water Resources	⊖	N/A	⊙	⊙	⊙	⊙
Facilities	⊙	N/A	○	⊗	⊖	○
Energy Demand / Energy Generation	⊙	N/A	○	○	⊖	○
Land Use Conflict / Compatibility	⊖ ⊙	N/A	⊙	⊖	⊖	○
Hazardous Material / Hazardous Waste	○	N/A	⊙	⊖	⊖	○
Traffic and Transportation	⊖ ⊙	N/A	⊙	⊗	⊙ ⊖	○
Socioeconomics	⊖ ⊙	N/A	⊙	⊖	⊖ ⊗	○

⊗ = Significant Adverse

+ = Beneficial Impact

⊖ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

4.1 U.S. ARMY GARRISON, HAWAI'I

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 (WAAF), 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; the 8th Theater Sustainment Command (TSC) and its subordinate units; the US. Army Pacific Command (USARPAC); the 45th Corps Support Group (Forward); and a variety of combat support and sustainment units. Hawai'i 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.

Installations in Hawai'i capable of supporting growth and realignment as part of the Proposed Action are Schofield Barracks Military Reservation (SBMR) and Fort Shafter. Units stationed as part of the growth and realignment to support operations in the Pacific would be stationed at these locations and conduct administrative functions and garrison operations (office functions, vehicle and equipment maintenance, Soldier recreation and living quarters etc.) from these locations. SBMR includes the Schofield Barracks Main Post (SBMP), South Range, and Schofield Barracks East Range (SBER); however, throughout the analysis we identify areas by their more specific description (South Range and SBER). Troops are housed on main post; 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), Kawaihoa Training Area (KLOA), and Wheeler Army Airfield (WAAF) on O'ahu. On the Island of Hawai'i, units would train at Pohakuloa Training Area (PTA), which includes the West PTA, and Bradshaw Army Airfield (BAAF). Training resources that would be used by growth and realignment units include an assortment of live-fire and non-live-fire maneuver training facilities, fixed-position live-fire training facilities, and a combination of other Army ranges.

Live-fire weapons qualification and maneuvers occur at SBMR and PTA, while non-live fire maneuver training occurs at other locations. Although no live-fire currently occurs at KTA, once construction of a planned CACTF is complete (supporting currently stationed units) live-fire training will occur using the SRTA. 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. No live-fire exercises are conducted on SBER; all exercises are limited to blank and pyrotechnic ammunition. The Army has established 1,000 foot noise buffer zones between the range and Wahiawa residential areas. The use of small arms blank ammunition is not authorized on select SBER ranges between 6PM and 6AM.

WAAF is in central O'ahu and is bordered by SBMR and SBER. WAAF 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 is used primarily for helicopter training. Access to KLOA is limited due to unimproved roads, steep terrain, and dense vegetation. KLOA consists of 23,348 acres. 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 (DOT), 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.

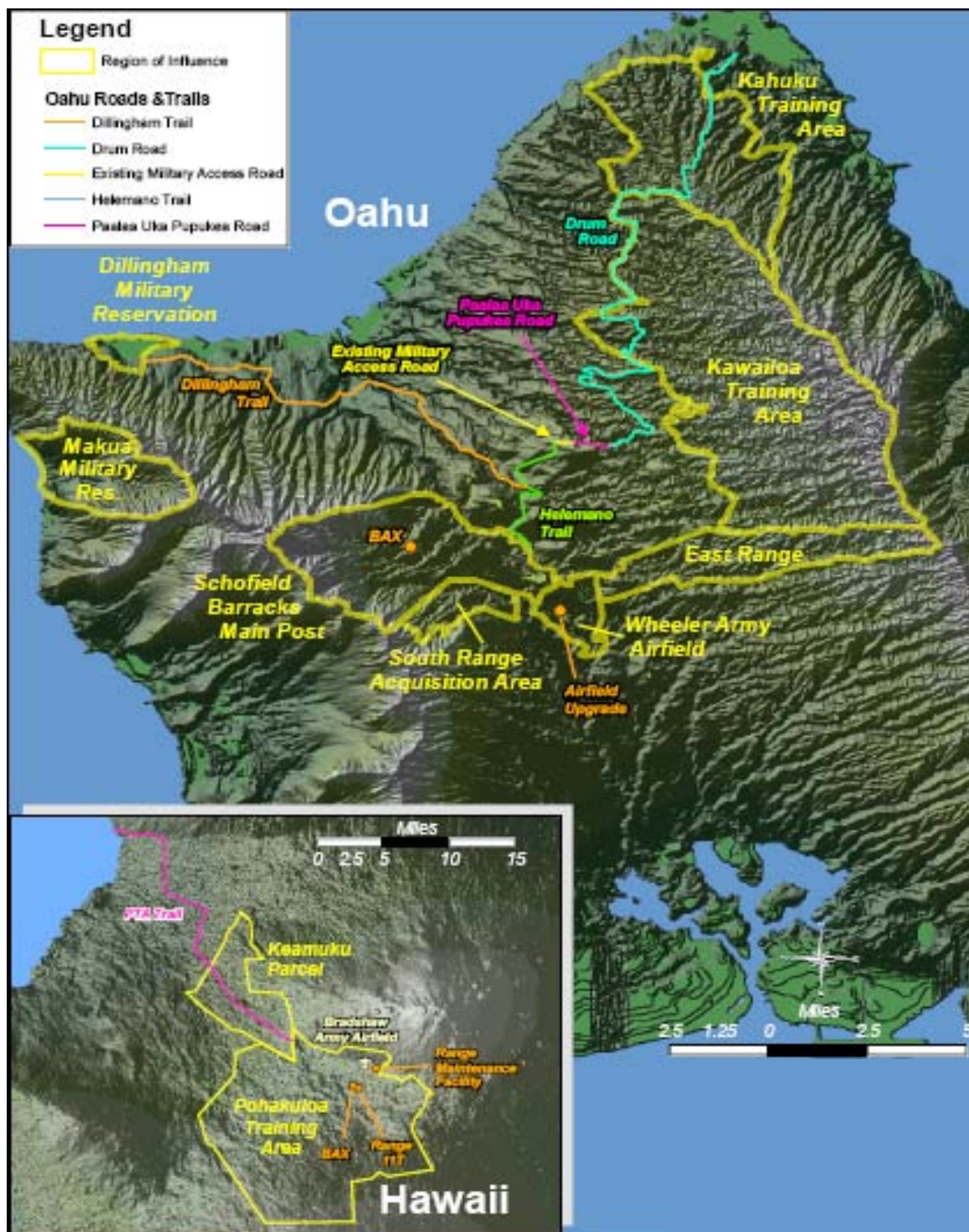
KTA is a 9,398 acre maneuver site that is located on the northern end of O'ahu. It is the largest contiguous ground maneuver training area on O'ahu. The northern portion of the installation supports all tactical maneuver training scheduled on KTA. Training includes jungle warfare training, pyrotechnics, 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 since the acquisition of the Keamuku parcel. 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 allows for 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, combat support, and combat service support units to conduct integrated training in an operational scenario.

Attainment of operational readiness of these units is not dependent on the use of Makua Military Reservation (MMR). While the MMR is an integral part of USAG-HI training capabilities and historically used by other services, Army growth units could perform live-fire training at other ranges. Commanders of newly stationed units might choose to use MMR if the range is available following completion of the Makua ROD, but the training area is not projected to be required for new growth units. For purposes of stationing decisions made as part of this analysis it is assumed that MMR is unavailable for training purposes.

Figure 4.1-1 on the next page depicts the locations of USAG-HI major training areas and their geographic locations on the islands of O'ahu and Hawai'i. Figure 4.3-1 depicts the geographic location of Ft. Shafter, and Figure 4.4-1 depicts the Pohakuloa Training Area on the Big Island of Hawai'i.

Figure 4.1-1. Map of O'ahu and Hawai'i illustrating locations evaluated



4.2 Schofield Barracks, Hawai'i & O'ahu Training Sites

Schofield Barracks & O'ahu Training Sites Summary

This section provides an overview of the actions the Army would take to implement the Proposed Action under each stationing scenario at Schofield Barracks. The Army would undertake four primary types of actions to support new unit stationing. These actions include cantonment construction, training infrastructure construction, live fire training, and maneuver training activities. The discussion of environmental consequences to each resource discusses the impacts of each type of activity and assesses the combined impact of these activities on a given resource. Table 4.2-1 below lists the environmental impacts that are anticipated to occur if the Army were to implement various different unit stationing assignments to Schofield Barracks to support growth of the Army needed to support operations in the Pacific Theater. Stationing scenarios possible at Schofield Barracks include the stationing of 1,000 additional Combat Support (CS) or Combat Service Support Soldiers (CSS), 3,000 additional CS or CSS Soldiers, or a new Combat Aviation Brigade. The Army is not considering the stationing of a Fires Brigade in Hawai'i, and therefore its analysis is not included in this section. A summary of the symbology that discusses intensity of anticipated environmental impacts is provided below:

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

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Table 4.2-1. Schofield Barracks & O'ahu Training Sites VEC Ratings

Schofield Barracks & O'ahu Training Sites, Hawai'i					
VEC	Combat Service Support (1,000 Soldiers)	Combat Support (1,000 Soldiers)	Combat Aviation Brigade (2,800 Soldiers)	Combat Service Support (3,000 Soldiers)	Combat Support (3,000 Soldiers)
Air Quality	Less than Significant	Less than Significant	Significant but Mitigable	Less than Significant	Less than Significant
Air Space	Minor	Minor	Less than Significant	Minor	Minor
Cultural	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Noise	Less than Significant	Significant but Mitigable	Minimal	Significant but Mitigable	Significant but Mitigable
Soil Erosion Effects	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Biological Resources	Minor	Less than Significant	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Wetlands	Minimal	Minimal	Minimal	Minimal	Minimal
Water Resources	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Facilities	Minimal	Minimal	Significant but Mitigable	Less than Significant	Less than Significant
Energy Demand/ Generation	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Land Use Conflict/ Compatibility	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Haz Mat/ Haz Waste	Minor	Minor	Minor	Minor	Minor
Traffic and Transportation	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Socioeconomics	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable

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Schofield Barracks & O'ahu Training Sites Introduction

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Schofield Barracks Military Reservation (Schofield Barracks) is located on the island of O'ahu, approximately 22 miles to the northwest of the capital City of Honolulu. Prior to its military use, historical land uses of this area include agricultural, primarily Sheep grazing and cultivation, until 1899 when the land was set aside for a military post. By 1914, Schofield Barracks was a permanent base and full-time training camp. During World War II the installation became home to the 24th and 25th Infantry Divisions; and during the war in Vietnam Schofield Barracks served

as a Soldier staging center (U.S. Army, 1994). Some of the 25th ID subordinate units stationed there include the 2nd and 3rd BCTs 25th ID, 25th Combat Aviation Brigade, 25th Special Troops Battalion, and the 556th Personnel Service Battalion.

4.2.1 Schofield Barracks Proposed Actions to Support Army Stationing Scenarios

As discussed in Chapter 4.0 (Methodologies) the Army is evaluating several stationing scenarios in USAG-HI that could result in impacts. These scenarios include the stationing of an additional 1,000 combat support or combat service support troops; 3,000 combat support or service support troops; or an additional aviation brigade. The Army does not anticipate requirements to station a Fires Brigade (Field Artillery) in Hawai'i. Each of these stationing scenarios could result in environmental impacts from cantonment area construction, training range and infrastructure construction, firing range use, and maneuver training. A description of activities that would be implemented as part of each scenario is provided below:

Scenario 1: Growth by 1,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Schofield Barracks, South Range Acquisition Area (See Figure 4.2-1 below). This is one of the few locations that has buildable space to support the cantonment operations of additional units. Growth by 1,000 additional Soldiers would drive requirements for 80-100 acres of facilities construction in the South Range. Cantonment construction in the South Range will require establishment of supporting facilities to include wastewater transport, water lines, upgrading of roads and bridges, and construction of an additional sub-station for increased power supply. In addition to these cantonment construction requirements, drainage projects would be sited to channel water during storm events.

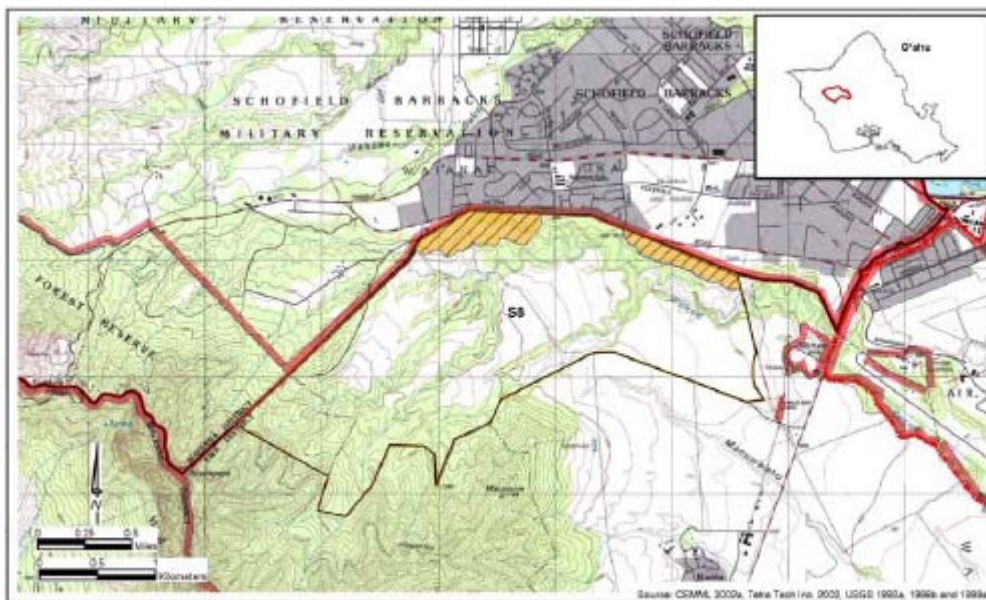


Figure 4.2-1. South Range area (center of map)

In addition to the construction of cantonment facilities at the South Range a Soldier barracks and parking area would be constructed on SBMR's existing cantonment area. The barracks would be a standard Army barracks and have the capacity to accommodate 192 Soldiers with their associated parking requirements for civilian vehicles. This barracks would be sited in the existing cantonment area and the Army would take down existing facilities to establish the barracks. Figure 4.2-2 below depicts a possible location for the barracks at SBMR which would involve the siting of the barracks on outdated family housing units.

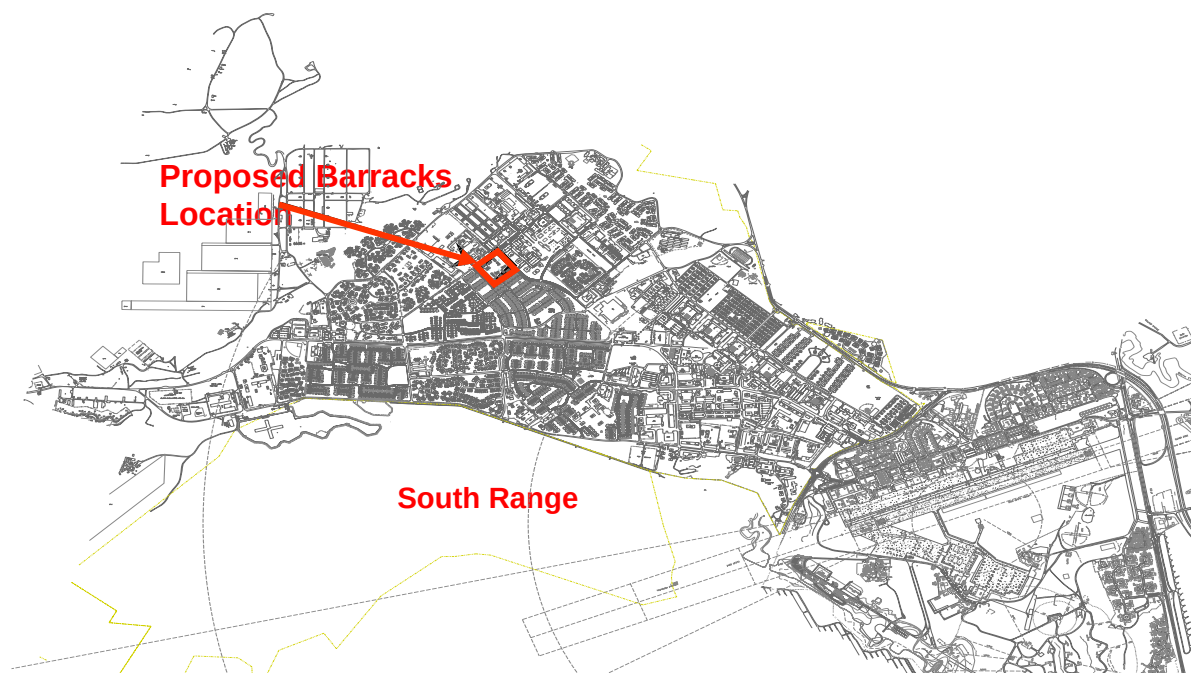


Figure 4.2-2. Possible location for a Soldier barracks at SBMR

Training Range Infrastructure Construction: The combination of existing and previously planned training range infrastructure would be able to meet the stationing needs of units under this scenario. No new range construction would be required. Under this stationing scenario, training range managers would potentially need to expand training hours for night-time training activities to accommodate all training but would not construct additional ranges.

Live-fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual weapons (pistols, rifle, and light machine gun) and crew served weapons qualification with heavy machine guns. Most of these firing activities would be conducted on existing qualification ranges on SBMR and on South Range. There are no new impacts that would be anticipated from these activities, though there would be a slight increase in the number of live-fire activities over current live-fire activities (approximately 5 percent increase) attributable to this unit stationing scenario. In addition to these activities, CSS units also may support and conduct training operations in an urban setting at Kahuku Training Area with simulated munitions.

Maneuver Training: Units stationed under this scenario would not involve any appreciable increase in the amount and scale of maneuver training that takes place in Hawai'i. CSS units will support the maneuver training exercises of combat units; supporting their logistics and support requirements. Off-trail maneuver by these units would be limited, with major operations consisting of re-supply, transport of equipment, and command and control functions. A majority of maneuver operations would take place at PTA on existing road and training infrastructure. Additional small unit (platoon and company) maneuver support missions would be supported at KLOA or DMR. Off-road travel would be minimal and significant off-road maneuver requirements would not be anticipated. Under this stationing scenario vehicular maneuver (primarily on-trail) would increase by approximately 5 to 10 percent over current maneuver training.

Scenario 2: Growth by 1,000 Additional Combat Support Soldiers

Cantonment Construction: Same as discussed for Scenario 1.

Training Range Infrastructure Construction: Same as discussed for Scenario 1.

Live-fire Training: Training activities of CS units would primarily involve weapons qualifications with individual weapons (pistols, rifle, and light machine gun) and crew served weapons qualification with heavy machine guns and MK-19 grenade machine gun systems. Most of these firing activities would be conducting on existing Qualification ranges on SBMR and on the Qualification Training Range on South Range. Additional impacts would include demolitions training and other live-fire training that engineer and military police units would engage in. This stationing scenario would increase the volume of live-fire activities on both individual and collective unit training ranges at SBMR, South Range, and PTA, though the increase would be minimal given the total number of troops stationed in Hawai'i. In addition to these activities, CS units would also conduct training operations in an urban setting at Kahuku Training Area with simulated munitions. These units would conduct separate training events to maintain urban operations proficiency as well as support integrated training events with other maneuver units. There would be an approximate 5 to 10 percent increase in live-fire activities (over existing live-fire training) as part of this stationing scenario.

Maneuver Training: CS units will support the maneuver training exercises of combat units providing special combat capabilities to maneuver units during maneuver training rotations at PTA and during other smaller maneuver training events held at O'ahu maneuver training areas. Off-trail maneuver by CS units would occur as these units trained with combat units. Major operations would consist of establishing checkpoints, providing security, reconnaissance tasks, engineering support tasks, route clearance, and other special functions. A majority of maneuver operations would take place at PTA training area on existing road and training infrastructure. Additional small unit maneuvers (platoon and company) would be supported at KLOA or DMR. Under this stationing scenario vehicular maneuver would not be increased by more than 10 percent over existing levels.

Scenario 3: Growth by 3,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Schofield Barracks, South Range (See Figure 4.2-1). This is one of the few locations that has buildable

space to support the cantonment operations of additional units. Growth by 3,000 additional Soldiers would drive requirements to build on 200-300 additional acres of land in the South Range within the general areas identified in Figure 4.2-1. Cantonment construction in the South Range will require establishment of supporting facilities to include wastewater transport, water lines, upgrading of roads and bridges, and construction of an additional sub-station for increased power supply. In addition to these cantonment construction requirements, drainage projects would be sited to channel water during storm events. As discussed under the first scenario, a barracks facility capable of accommodating 192 additional Soldiers would be sited in available space in the existing cantonment area at SBMR.

Training Range Infrastructure Construction: The addition of 3,000 CSS Soldiers would mainly be supported by existing and planned range infrastructure at SBMR and South Range. Scheduling of training for individual weapons qualification events might be extended to maximize training capacity of existing range infrastructure.

Live-fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual weapons (pistols, rifle, and light machine gun) and crew served weapons qualification with heavy machine guns. These firing activities would likely be conducted on existing Qualification ranges on SBMR and on the Qualification Training Range on South Range. This stationing scenario would increase the volume of live-fire activities on both SBMR and South Range, and would require ranges to operate at maximum capacity and extend operational hours. In addition to these activities, CSS units would also conduct training operations in an urban setting at Kahuku Training Area with simulated munitions. These units would conduct separate training events to maintain urban operations proficiency as well as support integrated training events with other maneuver units. There would be an approximate 15 to 20 percent increase in live-fire activities (over existing live-fire training activities) as part of this stationing scenario.

Maneuver Training: CSS units will support the maneuver training exercises of combat units; supporting their logistics and support requirements. Off-trail maneuver by these units would be limited, with major operations consisting of re-supply, transport of equipment, and command and control functions. A majority of maneuver support operations would take place at PTA training area on existing road and train infrastructure. Additional maneuvers might be supported at KLOA or DMR. Off-road travel would not be anticipated. Under this stationing scenario vehicular maneuver (primarily on-trail) would increase by approximately 15 to 25 percent over current maneuver training.

Scenario 4: Growth by 3,000 Additional Combat Support Soldiers

Cantonment Construction: Same as discussed in Scenario 3.

Training Range Infrastructure Construction: The addition of 3,000 CS Soldiers would mainly be supported by existing and planned range infrastructure at SBMR and the South Range. Scheduling of training for individual weapons qualification events might be extended to maximize training capacity of existing range infrastructure.

Live-fire Training: Training activities of CS units would primarily involve weapons qualifications with individual weapons (pistols, rifle, and light machine gun) and crew served weapons qualification with heavy machine guns and MK-19 grenade machine gun systems. These firing activities would be conducted on existing ranges on SBMR and South Range.

1 Along with impacts from individual weapons qualification activities, impacts from CSS units
2 would include demolitions training and collective live-fire training that engineer and military
3 police units would engage in. This stationing scenario would increase the volume of live-fire
4 activities on both individual and collective unit training ranges at SBMR, South Range, and PTA.
5 In addition to these activities, CS units would also conduct training operations in an urban
6 setting at Kahuku Training Area with simulated munitions. These units would conduct separate
7 training events to maintain urban operations proficiency as well as support integrated training
8 events with other maneuver units. There would be an approximate 10 to 25 percent increase in
9 live-fire activities (over existing live-fire activities) as part of this stationing scenario.

10
11 **Maneuver Training:** CS units will support the maneuver training exercises of combat units
12 providing special combat capabilities to maneuver units during maneuver training rotations at
13 PTA and during other smaller maneuver training events held at O'ahu maneuver training areas.
14 Off-trail maneuver by CS units would occur as these units trained with combat units. Major
15 operations would consist of establishing checkpoints, providing security, reconnaissance tasks,
16 engineering support tasks, route clearance, and other special functions. A majority of maneuver
17 operations would take place at PTA training area on existing road and train infrastructure.
18 Additional small unit maneuvers (platoon and company) would be supported at KLOA or DMR.
19 The volume of on and off-trail maneuver would be anticipated to increase proportionately in
20 terms of discussion as part of stationing scenario 2. Under this stationing scenario vehicular
21 maneuver would increase by approximately 15 to 25 percent above existing maneuver activities.

22 23 24 **Scenario 5: Growth by a 2,800 Soldier, Combat Aviation Brigade**

25
26 **Cantonment Construction:** As part of this alternative, additional garrison infrastructure such
27 as company operations facilities (COFs), Headquarters buildings, and storage buildings would
28 be sited on Schofield Barracks and South Range (See Figure 4.2-1 above). These are among
29 the few locations that has buildable space to support the cantonment operations of additional
30 units. Growth by an additional 2,800 Soldiers would drive requirements to build on 100-150
31 additional acres of land in the South Range within the general areas identified in Figure 4.2-1.
32 Cantonment construction in the South Range would require establishment of supporting
33 facilities to include wastewater transport, water lines, upgrading of roads and bridges, and
34 construction of an additional sub-station for increased power supply. In addition to these
35 cantonment construction requirements, drainage projects would be sited to channel water
36 during storm events.

37
38 In addition to cantonment construction that would be needed in the South Range in the form of
39 operations and administrative facilities and barracks, the Army would need to build equipment
40 storage and maintenance facilities at Wheeler Army Airfield (WAAF) (Figure 4.2-3). The Army
41 would construct additional aircraft hangars to conduct storage and maintenance of aircraft and
42 other equipment that would be stationed with the Combat Aviation Brigade. Currently WAAF
43 has several hangar facilities suitable for a battalion-sized aviation unit, but more hangar space,
44 parking, and administrative facilities would need to be sited there to support this scenario. In
45 addition, an increased number of underground or above ground fuel storage tanks would be
46 needed to support this unit. In order to accommodate construction of additional facilities at
47 WAAF, some existing facilities or functions at WAAF may need to be relocated to Schofield
48 Barracks. If a new CAB were to be stationed at USAG-HI, additional planning would need to be
49 conducted in order to determine potential relocation opportunities, impacts, and alternatives.

1

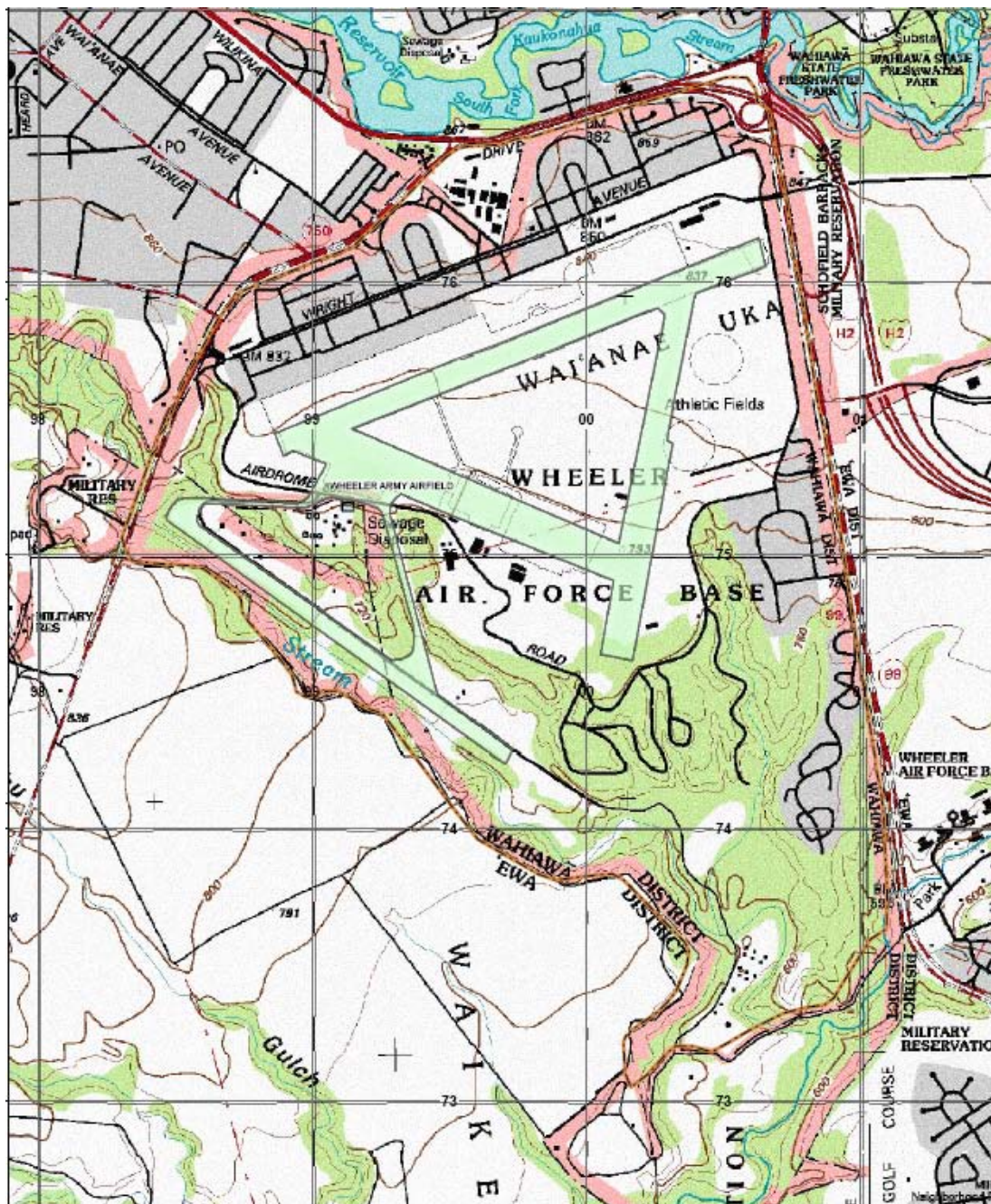


Figure 4.2-3. Wheeler Army Airfield proposed construction area

Training Range Infrastructure Construction: The addition of up to 2,800 aviation Soldiers would mainly be supported by existing and planned range infrastructure at SBMR and the South Range. Scheduling of training for individual weapons qualification events taking place on SBMR and South Range ranges might be extended to maximize training capacity of existing range infrastructure.

1 **Live-fire Training:** Training activities for an aviation brigade would primarily involve weapons
2 qualifications for Soldiers on their individual weapons (pistols, rifle, and light machine gun) and
3 crew served weapons. These firing activities would be conducted on existing ranges on SBMR
4 and South Range. A heavier volume of fire would occur on existing ranges at SBMR and South
5 Range.
6

7 At PTA, helicopter crews would rehearse door gunnery tasks and other live-fire tasks that are
8 discussed in Chapter 4.4 as part of the PTA discussion.
9

10 **Maneuver Training:** USAG-HI in partnership with the Federal Aviation Administration and the
11 State of Hawai'i has designated specified routes for transit of military aircraft to and from PTA
12 training areas. These routes are compatible with existing land use during times that the military
13 is permitted to fly. The aviation unit would utilize designated airspace to access existing ranges
14 and training areas at PTA when departing WAAF. These units would support maneuver training
15 rotations of ground combat forces at SBMR and PTA's training facilities.
16

4.2.2 Schofield Barracks & O'ahu Training Sites Affected Environment and Environmental Consequences

This chapter discusses the existing baseline conditions for each environmental resource as well as the anticipated consequences to Schofield Barracks should the Army implement one of the stationing scenarios discussed in Chapter 4.2.1.

4.2.3 Air Quality

4.2.3.1 Affected Environment

The Region of Influence (ROI) for air quality is dependent upon the pollutant and source of emission under consideration. The ROI for a regional secondary pollutant such as ozone (O₃) is generally the entire island 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 (which could be measured under unfavorable dispersion conditions) may be diluted and dispersed by wind, resulting in lower pollutant concentrations at greater distances away from the source.

Major air emissions sources on Hawai'i include burning of sugar cane and emissions from volcanic activity and geothermic development. Hawai'i operates nine ambient air quality monitoring stations on O'ahu, one station on Kauai, two on Maui, and five stations on the large island of Hawai'i. Each air quality monitoring station is located in 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 particulate matter 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 addresses pollutants that are not covered by federal ambient air quality standards. Hawai'i has established significant ambient air concentration thresholds and criteria for hazardous air pollutants (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 4.2-2, below.

Table 4.2-2. State and National Ambient Air Quality Standards Applicable in Hawai'i

Pollutant	Averaging Times	State Standards	Federal Standards	Units
CO	1-hour	9	35	ppm
		10,000	40,000	µg/m ³
	8-hour	4.4	9	ppm
		5,000	10,000	µg/m ³
NO ₂	Annual (Arith. Mean)	0.04	0.053	ppm

Table 4.2-2. State and National Ambient Air Quality Standards Applicable in Hawai'i

Pollutant	Averaging Times	State Standards	Federal Standards	Units
SO ₂	3-hour	70	100	µg/m ³
		0.5	0.5	ppm
		1,300	1,300	µg/m ³
	24-hour	0.14	0.14	ppm
		365	365	µg/m ³
	Annual (Arith. Mean)	0.03	0.03	ppm
Ozone	1-hour	80	80	µg/m ³
		-	0.12	ppm
		0.08	0.08	ppm
PM ₁₀	24-hour	157	157	µg/m ³
		150	150	µg/m ³
		50	Revoked	µg/m ³
Lead	Quarterly Average	1.5	1.5	µg/m ³
Hydrogen Sulfide	1-hour	0.025	-	ppm
		35	-	µg/m ³
PM _{2.5}	24-hour	-	35	µg/m ³
	Annual (Arith. Mean)	-	15	µg/m ³

Source: Hawai'i State Department of Health (HSDH) 2007

Notes:

All standards except the national PM₁₀ and PM_{2.5} standards are based on measurements corrected to 25 degrees C and 1 atmosphere pressure.

The national PM₁₀ and PM_{2.5} standards are based on direct flow volume data without correction to standard temperature and pressure.

The "10" in PM₁₀ 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% mass efficiency by certified sampling equipment. The maximum particle size collected by PM₁₀ samplers is about 50 microns. The maximum particle size collected by PM_{2.5} samplers is about 6 microns.

ppm = parts per million

µg/m³ = micrograms per cubic meter

- For noncarcinogenic compounds, an 8-hour average concentration equal to 1 percent of the corresponding 8-hour threshold level value (TLV) 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 TLV value adopted by OSHA;
- For noncarcinogenic compounds for which there is no OSHA-adopted TLV, 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; and
- 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.

There are no air quality monitoring stations close to SBMR or SBER facilities; 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 the years 2004 to 2006, concentrations of Particulate Matter measured at 10 and 2.5 µm (PM₁₀) 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 three years was the federal 24-hour PM₁₀ 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, two incinerators for document destruction, government and personal vehicle traffic, aircraft flight operations, various equipment operations, ordnance firing and detonation during training, controlled burning on ranges, and unplanned wildfires.

The Army operates three automated weather stations at SBMR that it utilizes for monitoring and predicting fire hazard conditions at the range areas. Although weather data from these stations have not been fully summarized, historical data from Wheeler Army Airfield show the average daily minimum temperature range to be from 60°F in January to 69°F in August. Average daily maximum temperatures range from 75°F in March to 83°F in September. The average precipitation rate is 37.9 inches per year and ranges from 1.38 inches in July to 5.22 inches in December. Wind speeds recorded at SBMR are generally light, averaging between 1 and 7 miles per hour (mph); while at SBER they range from 1 to 8 mph. The maximum wind speed rarely exceeds 15 mph. The average temperature at these facilities is generally consistent with the remainder of the island and can be found at Hawai’i’s official tourism website (www.gohawaii.com, n.d.).

There is no air quality monitoring stations close to Dillingham Military Reservation (DMR). 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 Makua Military Reservation.

There is no air quality monitoring stations located at KTA or KLOA. 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 did exceed 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.

4.2.3.2 Environmental Consequences

Schofield Barracks

CS (1,000), CSS (1,000), CS (3,000), CSS (3,000): (Less than Significant).

Cantonment Construction. Short-term impacts are possible under each of these stationing scenarios. SBMR’s main post does not currently have additional vacant space and housing needed to support an additional 1,000 or more Soldiers and their Families. The construction required, as indicated in Chapter 4.1 in the 1,000 and 3,000 Soldier stationing scenarios may be needed to meet shortfalls in Family housing, Child Development Centers, headquarters

buildings, barracks, and other facility types. Construction may occur within the boxed areas depicted in Figure 4.1-1 on page 15, within the South Range Acquisition Area (SRAA).

Impacts to air quality 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 the provisions of Hawai'i Administrative Rules on fugitive dust in accordance with §11-60.1-33.

Training Range Infrastructure Construction. Short-term effects may occur. As indicated in Chapter 4.1 Scenarios 1 & 2 (1,000 Soldiers), these units would utilize existing ranges or previously planned weapons qualification ranges on which to train; therefore no additional impacts are anticipated.

Live-fire Training. Soldiers under the stationing scenarios discussed above would train to meet semi-annual live-fire training requirements. At SBMR and South Range, the emissions released into the environment from live-fire training would result from the use of hand-held weapons such as rifles; crew served weapons such as machine guns; and explosive munitions. Units may also use training obscurants, such as smoke, as part of their routine training. Rifles and Machine Guns have very low emissions rates; while smokes may lay an obscuration cloud with surface concentrations of 4 mg/m² to 260 mg/m² (this is a high estimate) these items are generally dispersed quickly (depending on wind speed and direction) (Driver et al, 1993). 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 (www.epa.gov/ttn/chief/ap42/ch15/index.html, n.d.).

At DMR, smoke and flares would remain the predominant munitions items used. 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 slightly the risk of wildfires and their associated air pollutant emissions (for example PAHs). CS and CSS support units typically conduct large training events with- and in support of Brigade Combat Teams (BCTs). In addition USAG-HI is implementing measures discussed in its Integrated Wildfire Management Plan (IWFMP 2006). Live-fire activities are expected to result in impacts that are less than significant to air quality at Schofield Barracks.

Controlled burns are sometimes used to manage vegetation on range areas or to prepare areas for UXO clearance. Controlled burns are not frequent events and so the resulting emissions have not been estimated. These emissions would be considered in the prescribed burn plans prior to the actual burn event.

Maneuver Training. Under these scenarios, limited maneuver training would occur across the training areas of USAG-HI to include KTA, SBMR, South Range, SBER, KTA, KLOA and PTA

(discussed in Chapter 4.3). CS and CSS units would conduct training on the island of O'ahu to obtain proficiency in individual unit skills and would primarily support maneuver rotations at PTA.

Vehicles associated with CSS or CSS 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 particulate matter (PM) and Carbon Monoxide (CO).

Combat Aviation Brigade (2,800): (Significant but Mitigable).

Cantonment Construction. Impacts to support the stationing of an CAB would be similar to those discussed as part of alternatives to station the 3,000 CS or CSS Soldiers. The 60 to 80 helicopters associated with the CAB would be maintained at WAAF. While the Airfield has the facilities available to support an additional attack battalion-sized unit, it does not have adequate facilities to store the equipment required for an additional Aviation Brigade, as is being considered. Construction of new aircraft hangars would be needed. Construction would take place in existing pre-disturbed areas at WAAF and are anticipated to result in temporary air quality issues from vehicle emission and dust at that facility. Construction activities would be temporary and would conform to State regulations regarding air quality control. Hangar construction under this scenario would occur in the following location.

Training Range Infrastructure Construction. Temporary minor effects are anticipated. The garrison would need to consider reinforcing landing zones or adding new zones where helicopters will land and take-off during tactical maneuvers. Similar to construction at the cantonment area, construction equipment would remove vegetation and would disturb soils. Worker vehicles and construction equipment would generate CO and other emissions; as well as generate dust in the construction zone. BMPs would be used to mitigate fugitive dust emissions during construction.

Live-fire Training. Soldiers of the aviation brigade would train to meet semi-annual live-fire training requirements. The emissions released into the environment from live-fire training would result from the use of hand-held weapons such as rifles; crew served weapons such as machine guns; and explosive munitions. Units may also use training obscurants, such as smoke, as part of their routine training. Rifles and Machine Guns have very low emissions rates; while smokes may lay an obscuration cloud with surface concentrations of 4 mg/m² to 260 mg/m² (this is a high estimate) these items are generally dispersed quickly (depending on wind speed and direction) (Driver et al, 1993). Impacts on the Island of O'ahu are anticipated to be similar to those discussed under the 3,000 Soldier stationing scenarios.

Helicopter gunnery activities under this stationing scenario that would take place at PTA are discussed in Chapter 4.4.1.

Maneuver Training. Mobile source emissions would need to be accounted for as part of an annual emissions inventory, which is required of title V permit holders including Schofield Barracks, or for a general conformity review or a PSD (NSR) review. More detailed analysis would be required in order to determine the effects of an aviation brigade, and if modifications to the installation's Title V permit were required. This analysis would be conducted when the

specific types of units and aircraft associated with the units were determined if this stationing scenario is selected.

4.2.4 Airspace

4.2.4.1 Affected Environment

Airspace is defined by vertical and horizontal boundaries and time of use. The Federal Aviation Administration (FAA) manages the air navigation system, equipment, airports, and the rules and regulations relating to powered flight. The FAA is also responsible for managing the airspace for commercial airliners and air carriers, general aviation, and government agencies, including the U.S. military.

Six classes of airspace are designated by the FAA. Airspace designated as Class A, B, C, D, or E is controlled airspace. Class G airspace is uncontrolled airspace. Within controlled airspace, air traffic control (ATC) service is provided to aircraft in accordance with the airspace classification. No ATC service to aircraft is provided within Class G airspace, other than possible traffic advisories when the air traffic control workload permits and radio communications can be established.

Use of airspace is required for the successful operation of the U.S. military. Some military flight activities are not compatible with civilian uses of airspace, and some military activities potentially conflict with other uses of military airspace. Airspace restrictions are needed within military installations to ensure safety and to avoid possible conflicts of airspace use.

Large segments of controlled and uncontrolled airspace have been designated as special use airspace. Operations within special use airspace are considered hazardous to civil aircraft operating in the area. Consequently, civil aircraft operations may be limited or even prohibited, depending on the area. Special use airspace is divided into prohibited, restricted, warning, alert, and military operations area (MOA).

MOAs are airspaces designated for non-hazardous military flight training, and they were established to minimize interaction between high-speed military aircraft and civilian air traffic. These areas include horizontal coordinates (i.e., latitude and longitude), vertical zones (i.e., base and ceiling), use restrictions, and exclusions. Restricted areas denote the existence of unusual, often invisible hazards to aircraft, such as artillery firing, aerial gunnery, or guided missiles. Consequently, flights from non-participating civilian or military aircraft are prohibited during certain training exercises.

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. WAAF in central Hawai'i is also covered by Class D airspace with a ceiling 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 utilize airspace in O'ahu.

The Island of O'ahu also has several areas designated as Special Use Airspace. Uncontrolled (Class G) airspace exists from the surface to up to either 700 or 1,200 feet above mean sea level (MSL) over O'ahu in select locations.

4.2.4.2 Environmental Consequences

CS (1,000), CSS (1,000), CS (3,000), CSS (3,000): (Minor).

Cantonment Construction. Construction of Family housing, Soldier barracks, motor pools, or other facilities at SRAA or SBMR (barracks) is not anticipated to modify airspace. Therefore, no additional affects are expected.

Training Range Infrastructure Construction. No impacts are anticipated for these stationing scenarios as existing ranges would be able to meet their training requirements.

Live-fire Training. Minor effects would occur. The training of any of these scenarios would be similar to current training activities throughout the garrison. Training would generally involve the use of small arms ranges. A controlled firing area (CFA) is pre-established above existing ranges. 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.

Maneuver Training. Maneuver training of these ground-based units will have no effect on airspace at SBMR or O'ahu training sites.

Combat Aviation Brigade (2,800): (Less than Significant).

Cantonment Construction. The construction of additional hangars to accommodate aviation would not result in the modification to existing airspace designations. Furthermore, as noted in the Final SEIS for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (USAEC, February 2008), the Army is proposing to reorient the runway at PTA, which could potentially change instrument approach and associate procedures for approaches and departures in the cantonment area. Even with this proposal, this scenario is anticipated to have a less than significant impact from aircraft operations.

Training Range Infrastructure Construction. No affects are anticipated. Although landing zones in tactical training areas (SBER and KLOA) may need to be reinforced. These improvements would not require modifications to existing airspace.

Live-fire Training. Live-fire training would generally involve the use of small arms ranges. Existing ranges have pre-established CFAs. 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.

Live-fire activities associated with the aviation brigade are discussed in the section designated for PTA.

Maneuver Training. Long-term effects are anticipated. The helicopters associated with the aviation brigade would be stationed at WAAF; where the airfield is not currently constrained for aircraft use. The volume of helicopter flights and departures from WAAF would approximately double and would require further analysis of airspace use and scheduling requirements. Given that airspace usage would increase but not change existing flight corridors, the anticipated effects of this scenario should be mitigable through management of scheduling aviation

activities. Flight corridors commonly used by military traffic are well north of the major commercial flight corridors for Honolulu International Airport and are not anticipated to interfere with commercial flights. When supporting operations at PTA aviation units would continue to utilize the flight corridor designated for military traffic.

4.2.5 Cultural Resources

4.2.5.1 Affected Environment

Cultural resources are defined as historic properties, cultural items, archaeological resources, sacred sites, or collections. Cultural resources include prehistoric and historic archaeological sites, historic buildings and structures, and Native American or Native Hawai'ian traditional resources. In the source documents for this analysis, Native Hawai'ian traditional resources are discussed as areas of traditional interest (ATIs), these categories include traditional resources, use areas, and sacred sites that are potentially eligible for the National Register of Historic Places (NRHP) as traditional cultural properties (TCPs). These resources are subject to protection under the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order 13007 (Indian Sacred Sites), the Archeological and Historic Preservation Act (AHPA), the guidelines on Curation of Federally Owned and Administered Collections (36 CFR Part 79), and other federal and state regulations and treaties. Army Regulation implements Army compliance with the National Historic Preservation Act (NHPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), the Archeological Resources Protection Act (ARPA), the Archeological and Historic Preservation Act (AHPA), Executive Order 13007: Indian Sacred Sites; and other federal and state regulations and treaties.

Cultural and/or historical resources on SBMR and O'ahu training sites include such things as buildings, structures, sites, districts, properties of traditional religious and cultural importance, sacred sites or objects from prehistoric or historic occupation or activities.

The Army EIS for Transformation of the 2/25th Infantry Division (Light) to a Stryker BCT (2004)² identified five cultural landscape types of significance to Native Hawaiian tradition and culture. These include "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." All of these types of areas of cultural significance are found either on or near the military areas affected by the proposed action.

The ROI includes the geographic extent of SBMR, South Range, SBER, DMR, KTA, and KLOA. The ROI for cultural resources includes the areas of construction of new facilities and training areas to be constructed or used.

² Supplemented by the Environmental Impact Statement for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (February 2008)

Archaeological sites on SBMR and 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 trash 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 (loi) along the streams that flow through SBMR.

Archaeological surveys have been completed in the SBMR cantonment area, WAAF, and SBER. Investigations have documented 217 archaeological sites in 4,151 acres of survey (Annual report of cultural resource management of transformation projects (USAG-HI 2006)). Most archaeological sites have not been evaluated for NRHP eligibility. All identified cultural resources are being treated as eligible until such determinations are made. Archaeological sites that have been recommended as not eligible include five historical archaeological sites within the cantonment areas relating to military use of the property. No prehistoric sites have been identified within the cantonment area of SBMR; a prehistoric site has been identified at WAAF named Mauna Una.

A cultural resources survey has been conducted for the South Range. The Army would take every precaution to avoid impacts to cultural resources that have been identified if construction is required. Cultural resources have not been identified in areas most suitable for cantonment facilities construction. USAG-HI would need to conduct surveys of suitable cantonment area prior to any planned construction.

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. The best known among these important places is Kaena Point.

Archaeological evidence of prehistoric land use and settlement on DMR is limited. 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).

Most of DMR has been covered by archaeological surveys. Seven 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). All but

two of the archaeological sites are historic or traditional historic sites related to agriculture, transportation, or military use.

Archaeological 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.

KTA is on the northernmost point of the traditional Koolauloa District. Important 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 103 archaeological sites on KTA and 79 sites on KLOA. Thirty-eight of these sites are considered eligible or need to be evaluated for eligibility. Site probability models for KTA identify bluff slopes and edges and the mouths of narrow gullies as areas of high probability for surviving sites (USAG-HI 2004). Limited areas of KLOA that have not been surveyed due to very rugged and steep terrain have a low probability for sites. Some other areas that have not been surveyed are similar to areas with known sites.

A variety of Cold War era buildings and structures exist on KTA. The buildings and structures are principally the eligible Nike missile sites and associated facilities that were in use between 1961 and 1970. One of the stipulations resulting from Section 106 consultation over the demolition of the Nike missile site on DMR was that the KTA Nike site be preserved as an intact example of a Cold War Nike missile site.

Several ATIs have been identified on KTA including three heiau consisting primarily of rock platforms. One of these is believed to have been destroyed, but a recently identified cluster of features may be remnants of the site. Formal TCP and ATI surveys have been undertaken for KTA and KLOA. This project is ongoing.

4.2.5.2 Environmental Consequences

**CS (1,000), CSS (1,000), Combat Aviation Brigade (2,800), CS (3,000), CSS (3,000):
(Significant but Mitigable to Less than Significant).**

Cantonment Construction. For any of the proposed stationing scenarios construction may pose a potential risk to cultural or archaeological resources located at South Range. Documented archaeological sites are located on South Range to the north, south, and west of the where construction for several facilities could occur. The garrison will avoid building on known sites, and as part of this scenario the garrison staff would conduct Section 106 Consultation with the State Historic Preservation Office, the Office of Hawaiian Affairs, and appropriate Native Hawaiian organizations/individuals. Direct effects to undocumented resources could occur from grading/re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface.

Construction of a barracks at SBMR would occur as infill (built among existing structures) on previously disturbed land within the cantonment area; potentially within the footprint of existing structures (that would need to be demolished). It is reasonable to suggest no additional effects to cultural resources at SBMR would occur.

The impacts from construction at WAAF to accommodate an additional CAB would be mitigated through siting and proper planning. If facilities were to be constructed at disturbed or built-up locations where other facilities currently exist, these areas are anticipated to have been previously surveyed and known resources will be avoided. Siting new facilities in new locations of the cantonment area may require additional surveys for cultural resources. The garrison will avoid building on known sites, and as part of this scenario USAG-HI would conduct Section 106 Consultation with the State Historic Preservation Office, the Office of Hawaiian Affairs, and appropriate Native Hawaiian organizations/individuals as required.

Training Range Infrastructure Construction. No effects are anticipated. These stationing scenarios would be accommodated by existing range facilities.

Live-fire Training. Ranges and targetry are sited to avoid known cultural resources at South Range or SBMR following identification of these sites during cultural resource surveys.

Maneuver Training. Maneuver training may impact cultural resources. Maneuver training is restricted to prevent impacts to known cultural resources sites. Maneuver training under all scenarios would be conducted in the footprint of O'ahu training areas (particularly KTA, SBMR, and SBMR). Stationing scenarios involving CS units, particularly engineer or combat engineer units, may involve some surface excavation that could potentially uncover or damage undocumented cultural resources.

Increased training in USAG-HI maneuver areas could potentially limit Native Hawaiian access to sites of traditional or religious significance. The Army would continue to work closely with the Native Hawaiians, providing access to traditional religious and cultural properties in accordance with Executive Order 13007 and AIRFA (USAG-HI, February 2008).

4.2.6 Noise

4.2.6.1 Affected Environment

Noise zones (NZ) are based on Army land use compatibility and Center for Health Promotion and Preventative Medicine (CHPPM) guidelines. These guidelines are used to determine the best locations for varying activities when planning expansion into areas currently not exposed to any noise levels. NZ I conditions (L_{dn} levels below 62 dBA) are considered compatible with all residential land use. Approximately 15 percent of the population would be annoyed with these levels. NZ II conditions (L_{dn} levels of 62 to 70 dBA) are considered normally unacceptable for noise-sensitive land uses such as housing areas, educational facilities, and medical facilities. Approximately 15 to 39 percent of the population would be annoyed with these noise levels. NZ III conditions (L_{dn} levels over 70 dBA) are considered incompatible with residential and educational land uses. 40 percent or more of the population would be annoyed by these levels. Studies conducted by the EPA found that people living in noisy areas have acclimated to those noise levels and are less affected by the increased noise levels than people living in relatively quiet locations (U.S. Army CHPPM, 1999). Table 4.2-3 below expresses the sound exposure level at which certain noises may be audible over a 1-second time interval. As a basis of

comparison for the reader, military unique sounds are weighed against non-military unique sounds.

Table 4.2-3. A-Weighted Decibel Values for Example Noise Sources

Characterization	dBA	Example Noise Source or Condition	Other Noise Examples
Threshold of pain	130	Surface detonation, 30 pounds of TNT at 1,000 feet	
Possible building damage	120	Mach 1.1 sonic boom under aircraft at 12,000 feet	Air raid siren at 50 feet; B-1 flyover at 200 feet
	115	F/A-18 aircraft takeoff with afterburner at 1,600 feet	Commercial fireworks (5 pound charge) at 1,500 feet
	110	Peak crowd noise, pro football game, open stadium	Peak noise at firing position of rifle range
	100	F/A-18 aircraft departure climb out at 2,400 feet	Jackhammer at 10 feet; B-52 flyover at 1,000 feet
Extremely noisy	95	Locomotive horn at 100 feet; 2-mile range, foghorn at 100 feet	Wood chipper processing tree branches at 30 feet
8-hour OSHA limit	90	Heavy truck, 35 mph at 20 feet; leaf blower at 5 feet	Person yelling at 5 feet; dog barking at 5 feet
Very noisy	85	Power lawn mower at 5 feet; city bus at 30 feet	Pneumatic wrench at 50 feet; jet ski at 20 feet
Noisy	75	Street sweeper at 30 feet; idling locomotive at 50 feet	Beach with medium wind and surf
	70	Auto, 35 mph at 20 feet; 300 feet from busy 6-lane freeway	Stream bank 10 feet from small/medium waterfall
Moderately noisy	65	Typical daytime busy downtown area conditions	Beach with light wind and surf; tree branches, light wind
	55	Typical daytime urban residential area away from major streets	Leaves, tall grass rustling in light/moderate wind
	50	Typical daytime suburban conditions	Open field, summer night, insects
Quiet	45	Typical rural area daytime conditions	
	40	Quiet suburban area at night	
Very quiet	30	Quiet rural area, winter night, no wind	Quiet bedroom at night, no air conditioner
	20	Empty recording studio	Barren area, no wind, water, insects, or animals
Barely audible	10	Audiometric testing booth	
Threshold of hearing	0		

Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from construction sites seldom experience noteworthy levels of construction noise. Table 4.2-4 presents typical noise levels (dBA at 50 feet) that EPA has estimated for the main phases of outdoor construction.

Table 4.2-4. Noise levels associated with outdoor construction

Construction Phase	Sound Level (dBA)
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971

Noise conditions for the major stationing and training areas are described below, and are discussed in greater detail in the Final Environmental Impact Statement for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (U.S. Army, February 2008).

The most significant sources of noise at Schofield Barracks include vehicle traffic, weapons firing, and helicopter flights (which are heard at locations outside the installation boundary). Noise from heavy weapons firing does affect most of Schofield Barracks; and individual detonations are audible in residential areas near the boundaries of the installation.

Schofield Barracks consists of NZ II on the easternmost portion of the cantonment area, and NZ III at the westernmost area and southwestern portion of the cantonment area. NZ I (below 62dBA) includes the residential areas in the towns of Wahiawa, Mililani Mauka, and Mililani. This NZ is considered compatible with that land use).

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 post may also be affected

Recent 2/25th Stryker BCT stationing decisions resulted in NZ III conditions contracting at the northern portion of the main post; however NZ III may extend to encompass additional Family housing units on post. These changes may occur due to a potential for increasing the number of 155mm artillery rounds fired and due to an increase in nighttime artillery and mortar firing.

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.

The 65-dBA L_{dn} contour around WAAF extends into Leilehua Golf Course but not into any residential area. Aircraft flight noise at WAAF also affects residential areas on- and off-post.

There is no noise monitoring data available for DMR, KTA, or 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. No live-fire training occurs at DMR. 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 Stryker Brigade Combat Team (USAEC, February 2008)). Some noise effects from ordnance use at KTA may be experienced at nearby residential areas.

4.2.6.2 Environmental Consequences

CSS (1,000): (Less than Significant).

Cantonment Construction. Short-term effects are anticipated. As indicated above, noise associated with construction equipment will generally produce levels of 80 to 90 dBA at a distance of 50 feet. Permissible noise exposures identified by the Occupational Safety and Health Administration (OSHA) (29 CFR 1910.95) for an 8-hour work day is 90 dBA. Therefore construction noise at SBMR cantonment area (supporting the potential Soldier barracks) would likely be compliant with these levels; however these noise levels may be a nuisance to nearby installation staff/personnel. Given the temporary nature of proposed construction activities this effect is anticipated to be minor.

Potential construction locations at South Range are at distances greater than 1,000 feet from the nearest existing facilities or residences (Lynn Schneider, USACE Honolulu District). This is a distance greater than the zone of relatively high construction noise for major equipment operations. Given that locations more than 1,000 feet from construction sites generally do not experience significant noise levels. Construction at South Range is not anticipated to have significant impacts outside the installation boundary. Given the temporary nature of proposed construction activities and the limited amount of noise that construction equipment would generate, this effect is anticipated to be minor.

Training Range Infrastructure Construction. As no new ranges would be required to support this scenario, no effects are anticipated.

Live-fire Training. Long-term effects are expected due to training at South Range and SBMR. Current qualification ranges are close to Family housing at SBMR. The volume of noise at live-fire ranges is not expected to change because no new weapons systems would be introduced to the installation; however the increase in Soldier training may drive up the duration and occurrence of noise.

Due to the proximity to housing units the installation generally avoids using their QTRs beyond 2000 hrs (8:00 PM). This stationing scenario may result in the need for expanding range times beyond 2000 hrs, which may have potential affects 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 PM, these impacts are not anticipated to affect school-related activities.

There could be temporary disturbance effects to wildlife; however, no permanent effects are anticipated. The Army would continue to engage in live-fire activities under this stationing scenario similar to what is currently accomplished at the installation. Only a slight increase in live-fire activities is projected and would not be anticipated to have any new effects on wildlife populations. The effects to wildlife from live-fire activities are discussed in the section for biological resources.

Maneuver Training. Long-term effects are anticipated. Maneuver would continue to occur in the footprint of existing training ranges, primarily SBMR, SBER, KTA, and South Range. CSS

units would utilize the same types of equipment (trucks, light tactical vehicles, etc.) that are currently used in Hawai'i. Given existing noise levels and limited increases in maneuver training activities under this scenario, noise impacts would be projected to be similar in volume and duration of current maneuver activities. The effects are expected to be less than significant because the overall increase in maneuver training would be minimal, and there are few sensitive noise receptors around most maneuver training areas. Although, the residential communities of Wahiawa and Mililani Mauka are immediately adjacent to SBER and there have been noise complaints in the past on training activities conducted near these communities. USAG-HI may consider mitigation measures to counter an increase in training at SBER, to minimize the impact of training to residential communities. If a CSS unit is stationed at USAG-HI, site-specific analysis would identify specific training locations and impacts as they related to the specific unit training requirements.

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 standard operating procedures 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, ten or more vehicles per hour going to the same destination over the same route, or any one 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 AM and 8:30 AM and 3:00 PM and 6:00 PM, Monday through Friday). Movements on Saturday, Sunday, and holidays are by special request only.

CS (1,000), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. Short-term effects are anticipated. As indicated above, noise associated with construction equipment will generally produce levels of 80 to 90 dBA at a distance of 50 feet. Permissible noise exposures identified by the Occupational Safety and Health Administration (OSHA) (29 CFR 1910.95) for an 8-hour work day is 90 dBA. Therefore construction noise at SBMR cantonment area (supporting the potential Soldier barracks) would likely be compliant with these levels; however these noise levels may be a nuisance to nearby installation staff/personnel. Given the temporary nature of proposed construction activities this effect is anticipated to be minor.

Potential construction locations at South Range are at distances greater than 1,000 feet from the nearest existing facilities or residences (Lynn Schneider, USACE Honolulu District). This is a distance greater than the zone of relatively high construction noise for major equipment operations. Given that locations more than 1,000 feet from construction sites generally do not experience significant noise levels. Construction at South Range is not anticipated to have significant impacts outside the installation boundary. Given the temporary nature of proposed construction activities and the limited amount of noise that construction equipment would generate, this effect would be minor.

Training Range Infrastructure Construction. No construction would occur under these Soldier scenarios; therefore no effects are anticipated.

1 *Live-fire Training.* Long-term effects may occur. Noise levels associated with the weapons
2 utilized by CS units are consistent with current live-fire activities at SBMR. Noise zone II
3 (covering small arms live-fire) would continue to affect some undeveloped areas north and
4 south of SBMR, but would not expand into existing off-post residential areas. The increased
5 training at SBMR as a result of stationing 3,000 Soldiers would have a greater impact to on-post
6 and off-post receptors.

7
8 There could be temporary disturbance effects to wildlife; however, no permanent effects are
9 anticipated. The Army would continue to engage in live-fire activities under this stationing
10 scenario similar to what is currently accomplished at the installation. An increase of live-fire
11 training by up to 25 percent is expected to occur. The effects to wildlife from live-fire activities
12 are discussed in Chapter 4.2.8.

13
14 *Maneuver Training.* Long- or short-term effects may occur. SBER, South Range, SBMR, DMR,
15 and KTA would continue to support small unit maneuvers. Although there would be an increase
16 in Soldiers maneuvering in these areas, the type of noise would be consistent with ongoing
17 maneuver activities. The increased frequency of noise generating events would correspond to
18 the increased maneuvers associated with these stationing scenarios (10 to 25 percent).

19
20 Noise levels along on-post roadways and along military vehicle trails would increase; however,
21 overall traffic volumes and vehicle speeds generally are low for these types of roadways. As a
22 result, noise increments attributable to vehicle traffic would remain within the Army's land use
23 compatibility guidelines.

24
25 The effects from convoy travel to public roadways would be similar to what would be expected
26 for the 1,000 Soldier scenarios. The garrison would continue to implement policies on convoy
27 travel that would mitigate adverse effects from vehicle noise.

28 29 30 **Combat Aviation Brigade (2,800): (Minimal).**

31
32 *Cantonment Construction.* Short-term effects are anticipated. As indicated above, noise
33 associated with construction equipment will generally produce levels of 80 to 90 dBA at a
34 distance of 50 feet. Permissible noise exposures identified by the Occupational Safety and
35 Health Administration (OSHA) (29 CFR 1910.95) for an 8-hour work day is 90 dBA. Therefore
36 construction noise at SBMR cantonment area (supporting the potential Soldier barracks) would
37 likely be compliant with these levels; however these noise levels may be a nuisance to nearby
38 installation staff/personnel. Given the temporary nature of proposed construction activities this
39 effect is anticipated to be minor.

40
41 Potential construction locations at South Range are at distances greater than 1,000 feet from
42 the nearest existing facilities or residences (Lynn Schneider, USACE Honolulu District). This is
43 a distance greater than the zone of relatively high construction noise for major equipment
44 operations. Given that locations more than 1,000 feet from construction sites generally do not
45 experience significant noise levels. Construction at South Range is not anticipated to have
46 significant impacts outside the installation boundary. Given the temporary nature of proposed
47 construction activities and the limited amount of noise that construction equipment would
48 generate, this effect would be minor.

49
50 *Training Range Infrastructure Construction.* No construction would occur under these Soldier
51 scenarios; therefore no effects are anticipated.

1
2 *Live-fire Training.* Long-term effects may occur. Noise levels associated with the weapons
3 utilized by CS units are consistent with current live-fire activities at SBMR. Noise zone II
4 (covering small arms live-fire) would continue to affect some undeveloped areas north and
5 south of SBMR, but would not expand into existing off-post residential areas. The increased
6 training at SBMR as a result of stationing 2,800 Soldiers would have a greater impact to on-post
7 and off-post receptors.

8
9 There could be temporary disturbance effects to wildlife; however, no permanent effects are
10 anticipated. The Army would continue to engage in live-fire activities under this stationing
11 scenario similar to what is currently accomplished at the installation. An increase of live-fire
12 training by up to 25 percent is expected to occur. The effects to wildlife from live-fire activities
13 are discussed in Chapter 4.2.8.

14
15 Noise generated at the aerial gunnery range at PTA is discussed in Chapter 4.4

16
17 *Maneuver Training.* The addition of an aviation brigade would not change the type of flight
18 operations at WAAF or associated noise intensities, though the frequency of noise generating
19 events would be predicted to roughly double. Noise conditions in the vicinity of WAAF would
20 continue to be impacted by helicopter flight operations as a frequent activity.

21
22 Higher levels of helicopter flight operations would occur over SBMR and SBER. Much of the
23 maneuver required by aviation units is supported at PTA.

24 25 26 27 **4.2.7 Soil Erosion**

28 **4.2.7.1 Affected Environment**

29
30 The topography of USAG-HI ranges from nearly flat to sloping, to steeply sloping terrain,
31 dissected by mountain ranges. Soils generally consist of volcanic ash and silty clays, and are
32 high in magnesium, calcium, and iron. The soils are moderately permeable with slow surface
33 water runoff (U.S. Army, 1995). A brief description of soil characteristics and erodibility for the
34 region of influence is included in the paragraphs that follow.

35
36 The USAG-HI Integrated Training Area Management (ITAM) program is responsible for
37 inventorying and monitoring land conditions, educating land users to minimize potential adverse
38 impacts from use, integrates training requirements with land capacity, and provides land
39 maintenance and rehabilitation practices. The garrison manages the soils there primarily by
40 managing natural water run-off rates, erosion, and sedimentation in streams and other
41 waterbodies to ensure the continued and sustainable use of resources.

42
43 The main post of SBMR is geographically located within the Waianae Range geomorphic
44 province with the Kaukonahua stream to the east, and the town of Wahiawa to the west. The
45 elevation there ranges from 660 feet above mean sea level (amsl) to approximately 3,000 feet
46 amsl. The soils there are similar to much of the rest of the Hawaiian Islands, thin, acidic, and
47 derived from volcanic ash and high in organic matter. Soil erodibility is moderate to high
48 (USAG-HI, 2007).

49
50 Much of the South Range area is south of Waikele stream, and is comprised of east-sloping
51 upland sloping from an approximate elevation of 1,200 feet amsl in the southwest to roughly 850

feet amsl near WAAF 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.

WAAF is located between the SBMP and SBER facilities, at the southern portion of the Schofield Plateau. Wheeler is mainly flat with gentle slopes and has an elevation range of 860 feet amsl to 790 feet amsl. The soils there are well drained and are at least four (4) feet thick, developed on alluvium over weathered basalt. Water runoff is slow. The erodibility of soils there 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 there ranges from 2,681 feet amsl to approximately 850 feet amsl. 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 there 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 amsl to at or near sea level. The soils there 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).

4.2.7.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short-term effects may occur from construction at SBMP. The construction site would likely be located within a built-up parcel of the cantonment area where stormwater management practices may already be in place to mitigate potential adverse effects from sediment runoff.

Short-term or long-term effects would occur at South Range, but may be localized to the construction site. 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 gulches, gullies, or to other areas where post-precipitation event water may carry sediments to other waterbodies. Direct short-term effects may occur as construction equipment would disturb soils as a result of digging and excavation, increasing the potential for loose soil particles to be carried away by wind or precipitation. The effects to surface waters from run-off would be less than significant as by and large, surface water does not exist at South Range.

Training Range Infrastructure Construction. No effects are anticipated. Range construction is not expected to be required in support of these stationing scenarios.

Live-fire Training. Weapons firing can typically involve the disturbance of soils, denuding the soil surface of vegetation and increasing the erodibility of soils. While weapons firing would typically occur in existing training areas the frequency of the training events would increase and potentially cause a greater amount of soil disturbance, resulting in larger areas of bare ground than what is observed under current conditions. The installation's ITAM program would continue to implement BMPs and mitigation measures that would minimize the erosive effects from live-fire activities to soils.

For CS units, the use of ordnance items (such as the MK-19 Grenade Machine Gun) or explosives (associated with EOD personnel) could cause wildfires resulting in the removal of large areas of vegetation that normally protects soil from erosion by slowing surface runoff, intercepting raindrops before they reach the soil surface, and anchoring 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 (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, partly due to lack of lightning. Thus, native plant species are not well adapted to fire. Fire and loss of soil could reduce native plant species and encourage fast-growing nonnative 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.

Maneuver Training. The increased mounted and dismounted traffic on ranges may damage or remove vegetation and disturb soils to an extent that would substantially 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. It should be noted that off-road travel by CSS units is rare; these units are much more likely to use trails or roads and leading to a less than significant impact.

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

1 area. Management of soil sustainability at KTA would become more time intensive as more
2 monitoring and mitigation may be required.

3
4 DMR would continue to support some maneuver training. Large scale exercises would be
5 supported at PTA. Less than significant effects on land condition may occur because the land
6 damage would be limited to the existing roads and trails instead of distributed over the entire
7 DMR. As with KTA, the effects would be minimized due to USAG-HI institutional programs to
8 include the ITAM program.

9
10 The soils at KLOA primarily consist of silty clay which is well drained and runs deep in the
11 subsurface. Sloping areas throughout the range have finer soils and are more prone to erosion
12 from maneuvers and potentially increasing the effects to surface waters there from
13 sedimentation. Due to the terrain at KLOA, only a small amount of maneuver is supported.
14 Mainly maneuver is dismounted, occurring from helicopters transporting Soldiers to the training
15 area. Limited impacts would occur from stationing of 1,000 CS or CSS Soldiers.

16
17
18 **Combat Aviation Brigade (2,800), CSS (3,000), CS (3,000): (Significant but Mitigable).**

19
20 *Cantonment Construction.* Short-term effects may occur from construction at SBMP. The
21 construction site would likely be located within a built-up parcel of the cantonment area where
22 stormwater management practices may already be in place to mitigate potential adverse effects
23 from sediment runoff.

24
25 Short-term or long-term effects would occur at South Range, but may be localized to the
26 construction site. Long-term effects could occur from the compaction of soils, reducing the
27 likelihood for vegetation to re-establish itself and increasing the effects from wind erosion or
28 precipitation. Soils transported away from the construction area may accumulate in gulches,
29 gullies, or to other areas where post-precipitation event water may carry sediments to other
30 waterbodies. Direct short-term effects may occur as construction equipment would disturb soils
31 as a result of digging and excavation, increasing the potential for loose soil particles to be
32 carried away by wind or precipitation. The effects to surface waters from run-off would be less
33 than significant as by and large, surface water does not exist at South Range. Monitoring and
34 the use of BMPs would work to reduce any short- and long-term effects. No additional effects
35 (over the 1,000 Soldier scenarios) may occur from barracks construction at SBMP.

36
37 For construction of additional hangar facilities at WAAF, monitoring and the use of BMPs would
38 work to reduce any short- and long-term effects of soil erosion. Because much of the
39 construction is anticipated to occur within the cantonment area direct impacts to the
40 environment would be well contained. A final determination for potential facility siting and
41 planning would help to more accurately determine the effects from construction there.

42
43 *Training Range Infrastructure Construction.* No construction would occur under this Soldier
44 scenario; therefore no effects are anticipated.

45
46 Helicopter maneuver is expected to have less than significant effects at KLOA or SBEP. Wind
47 generated from helicopters at frequently used landing zones can loosen vegetation and soils.
48 To minimize the erosive effects at landing zones the garrison anticipates the need for hardening
49 soils there using a mixture of soil binder, gravel, and rocks, which would work to improve areas
50 susceptible to impacts from training with attack and medium/heavy lift helicopters.

1 *Live-fire Training.* Weapons firing can typically involve the disturbance of soils, denuding the
2 soil surface of vegetation and increasing the erodibility of soils. While weapons firing would
3 typically occur in existing training areas the frequency of the training events would increase and
4 potentially cause a greater amount of soil disturbance, resulting in larger areas of bare ground
5 than what is observed under current conditions. The installation's ITAM program would
6 continue to implement BMPs and mitigation measures that would minimize the erosive effects
7 from live-fire activities to soils.

8
9 Live-fire activities at South Range or SBMR could cause wildfires resulting in the removal of
10 large areas of vegetation that normally protects soil from erosion by slowing surface runoff,
11 intercepting raindrops before they reach the soil surface, and anchoring the soil with roots.
12 Without surface vegetation the top layer of soils may be transported away due to natural
13 processes, and the soil remaining may become compacted leaving little opportunity for
14 vegetation (especially native vegetation) to re-establish itself. Vegetation removal resulting from
15 wildland fires could result in increased soil erosion by water and wind, indirectly causing large-
16 scale removal and redeposition of soils, gulying, or unstable slopes in areas of steep slopes
17 and rapid runoff. The impact would be directly proportional to the size of the fire. Under natural
18 conditions, wildland fires occur infrequently in Hawai'i, partly due to lack of lightning. Thus,
19 native plant species are not well adapted to fire. Fire and loss of soil could reduce native plant
20 species and encourage fast-growing nonnative species that recover quickly after fires. Some of
21 these species may be more susceptible, or even dependent, on fire so that the occurrence of
22 wildland fires may help to increase the chance of future wildland fires. The installation's wildfire
23 management plan would be utilized to minimize the effects of live-fire activities to vegetation
24 while maintaining effects to a manageable area.

25
26 Live-fire aerial gunnery training would continue to be supported at PTA and is discussed in
27 Chapter 4.4.

28
29 *Maneuver Training.* Long-term effects may occur. There would be an increased intensity of
30 maneuver impacts at landing zones in KLOA and SBMR. Wind erosion from helicopter rotors
31 would increase rates of soil loss in localized areas. The installation would continue to
32 implement institutional programs to include the ITAM program to mitigate these impacts.

33
34 Larger-scale maneuver would continue to be supported at PTA
35
36
37

38 **4.2.8 Biological Resources**

39 **4.2.8.1 Affected Environment**

40
41 The extensive boundaries and variances in elevation on SBMR and its designated training sites
42 provide a wide diversity in wildlife habitats, highly urbanized areas, streams, native forest, and
43 grasslands (U.S. Army, March 1995). The ROI for biological resources includes those areas
44 where the extent of maneuver, helicopter, and live-fire associated with stationing scenarios
45 would potential pose impacts to vegetation and wildlife from human activities such as
46 construction and training. Therefore, the ROI for these scenarios could include SBMR, South
47 Range, DMR, SBMR, KLOA, KTA, and WAAF.

48
49 *Schofield Barracks:* Schofield is home to 59 rare plant species, 28 special status wildlife
50 species, 2 rare vegetation communities, and large expanses of Biologically Significant Areas.
51 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 amsl is the Montane wet okia forest, dominated largely by the okia tree. Ohia Shrubland is found at elevations between 2,500 and 3,000 feet amsl. 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 hiwi 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 nonnative grasses and shrublands found in fire-disturbed areas.

KTA & KLOA: KTA, which in total encompasses 8,528 acres, are 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 HINHP (1989 to 1993). Additional botanical and zoological information was collected on KLOA and adjacent land. 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 4.2-4 below 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 recently discovered in the ROI that are potentially devastating to the native communities of KTA are manuka (*Leptospermum scoparium*) and moho. 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 nonnative. 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.

DMR: 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. HINHP 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, HINHP 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 (BA) for military activities on the island of O'ahu. The USFWS responded with no jeopardy Biological Opinion (BO) (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 2003c and 2003d, respectively). The BO 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.

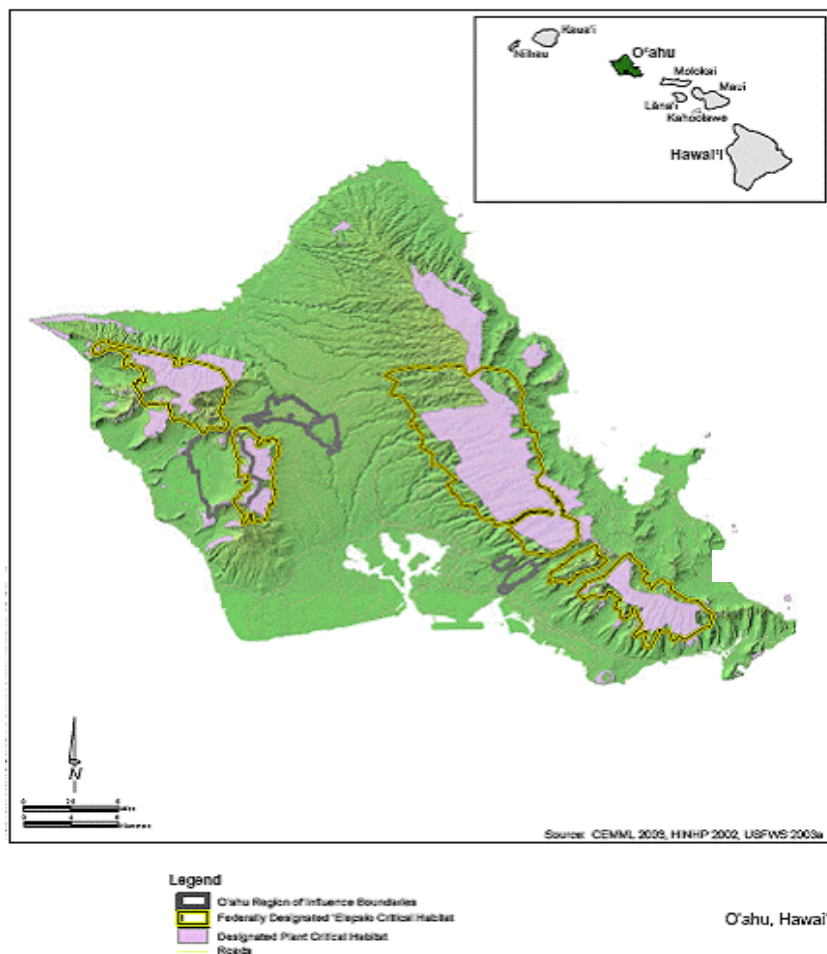


Figure 4.2-4. Plant critical habitat on O'ahu

4.2.8.2 Environmental Consequences

CSS (1,000): (Minor).

Cantonment Construction. Construction at SBMR would occur in a built-up parcel of the cantonment area that would not currently be supporting sensitive wildlife species.

Construction of facilities at the South Range would occur in areas that have already been disturbed (due to previous agricultural land use). This area already supports nonnative grasses and shrubs. Short-term impacts from construction noise is also expected, however these

activities have not shown to be detrimental to hunting and foraging behavior of wildlife (native or nonnative) that use these areas. This is supported by the studies below:

The U.S. Army Engineering District Honolulu (2000) found that human presence and elevated noise levels would displace various wildlife species during construction; however, impacts from range construction to wildlife would not be different than the impacts from normal operations and activities occurring in the anticipated construction footprints. Increased noise as a result of construction is not expected to affect terrestrial wildlife because field surveys have shown that it is not a significant factor in behavior and does not affect reproductive success. Studies by Bowles (1993), Holthuijzen et al. (1990), and Doesky et al. (2001) found that the effects from construction activities did not prove detrimental to the reproductive success of-, or adverse effect the quality of habitat for wildlife species.

The temporary increase in human presence and activity at construction sites may increase the potential for accidental wildfire ignition; however, the presence of workers would indicate a quicker identification and response to fire, thereby reducing the risk from accidental fire to wildlife habitat.

Training Range Infrastructure Construction. No impacts are anticipated.

Live-fire Training. The added small arms fire that would be conducted semi-annually is not anticipated to have long-term effects to wildlife. This action would involve introducing new types of weapons systems to Hawai'i. Therefore, the type and intensity of noise from live-fire activities is not anticipated to change; however, the number of noise generating events would slightly increase. 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 impacts to wildlife from live-fire (and similar) activities is discussed by (Bass et al. (1972), Hartley (1989), and Kulichkov (1992)), (Dooling, and; Schubert and Smith, 2000), Gese et al. (1989), Stephenson et al. (1996), Stalmaster and Kaiser (1997).

Both live- and nonlive-fire training could potentially increase the frequency of wildfires. Several fire mitigation measures are being implemented throughout the garrison on existing ranges and would be in place under all stationing scenarios. 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 will be constructed. Dip ponds will be constructed at SBMP and South Range. A new fire access road will 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: Two fire access roads are 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.

1 At KTA, nonlive-fire training with pyrotechnic devices still has the potential to ignite
2 wildfires; and the increased number of Soldiers training would increase the risk to
3 causing wildfires.
4

5 *Maneuver Training.* Long-term minor effects are expected. Maneuver would occur within the
6 footprint of existing training areas at KTA, KLOA, SBER, SBMR, South Range, and DMR. The
7 noise associated with maneuver training would not exceed the intensity of current noise levels
8 though the number of noise generating events would increase.
9

10 At SBMR, training would occur in existing maneuver areas. Maneuver impacts would
11 result in a reduction of vegetative groundcover and may increase the risk for
12 establishment of nonnative vegetation in these areas. Habitats and wildlife would be
13 impacted by loss of vegetation, deterring wildlife from foraging in these areas. Habitats
14 that would be impacted on SBMR consist primarily of nonnative vegetation.
15

16 Maneuvers may continue to occur throughout portions of SBER. Wildlife and vegetation
17 found in this highly disturbed area is primarily nonnative. Ground-dwelling wildlife and
18 vegetation would be adversely impacted as a result of the increase in maneuvers. The
19 increased use of trails under this scenario could result in the increase in the propagation
20 of invasive species between training areas.
21

22 South Range was previously used for intensive agriculture. Potential increases in
23 maneuver on existing trails may impact biological communities of the South Range
24 through an increase in noise generating events, potential further degradation of
25 vegetation and soils (which could indirectly impact surface water) near the existing trail
26 infrastructure, and through the potential for wildfire ignition. As discussed above, wildlife
27 may adjust to the increase in noise generating events; and the installation's ITAM and
28 maintenance programs would continue to monitor and mitigate impacts from increased
29 maneuver events. As indicated above, fire mitigation measures are being implemented
30 throughout the garrison on existing ranges and would be in place under all stationing
31 scenarios.
32

33 At DMR, maneuver training would occur on established roads or trails, as well as areas
34 currently designated for maneuver training throughout the installation, and may not affect
35 native habitats. The natural communities within the boundary of DMR are two types of
36 lowland dry communities that are on the cliff slopes at the southern end of the training
37 area. These areas may not be used for maneuver training and therefore may not be
38 affected.
39

40 The slopes at KTA are steep, and training activities are generally limited by the
41 topography to dismounted maneuvers and vehicle travel on established roads.
42 Vegetative regrowth is fairly rapid. The majority of the training area is nonnative
43 vegetation and common native plants, primarily grasses and shrubs, which typically
44 colonize denuded areas quickly and thoroughly. Sensitive plant and wildlife species
45 occur on KTA/KLOA; however, these species are not known to be located near existing
46 roads and trails. Manuka and heirba del solado are nonnative plants that have recently
47 been discovered in the ROI. USAG-HI would continue to implement their invasive
48 species management programs to minimize the spread of these species throughout the
49 training area.
50
51

CS (1,000): (Less than Significant).

Cantonment Construction. Similar to the CSS stationing scenario, construction would not pose a significant risk to vegetation or wildlife species in to either SBMP or South Range. These areas are either currently built-up (SBMP) or, in the case of South Range, already support nonnative grasses and shrubs. Short-term impacts to wildlife from construction noise is expected, however these activities have not shown to be detrimental to the success of wildlife species inhabiting or using the sites surrounding construction zones.

The temporary increase in human presence and activity at construction sites may increase the potential for accidental wildfire ignition; however, the presence of workers would indicate a quicker identification and response to fire, thereby reducing the risk from accidental fire to wildlife habitat.

Training Range Infrastructure Construction. No effects would occur.

Live-fire Training. Overall, the effects from live-fire activities would be similar to those expected under the CSS (1,000) Soldier scenario. This stationing scenario would not introduce any new types of weapons systems, though the number of firing activities would increase. The increased use of individual and crew-served weapons and demolition materials (used by these types of units) would mean more noise generating live-fire events and could increase the potential for wildfire ignition. The effects from noise may be temporary as many animals will adapt to noise in their surroundings over time, and may become accustomed to regular noise (site the studies listed above). USAG-Hi would continue their fire mitigation measures (as are currently being implemented). These measures would be in place under all stationing scenarios.

Maneuver Training. Effects would be similar under the CSS scenario; with the primary difference being the greater degree of off-road maneuver and ground clearance activities associated with CS units.

Maneuver would occur within the footprint of existing training areas at KTA, KLOA, SBER, SBMR, South Range, and DMR. The noise associated with maneuver training may not exceed the intensity of current noise levels though the number of noise generating events would increase.

CSS (3,000), CS (3,000), Combat Aviation Brigade (2,800): (Significant but Mitigable).

Cantonment Construction. Under these scenarios cantonment construction is anticipated to have a minor to less than significant effect to biological resources including vegetation and wildlife. These areas are either currently built-up (SBMP) or, in the case of South Range, have been utilized for intensive agriculture purposes and may already support nonnative grasses and shrubs. Short-term impacts to wildlife from construction noise is expected, however these activities have not shown to adversely impact wildlife species that inhabit or use the sites surrounding construction zones.

The temporary increase in human presence and activity at construction sites may increase the potential for accidental wildfire ignition; however, the presence of workers would indicate a quicker identification and response to fire, thereby reducing the risk from accidental fire to wildlife habitat.

Training Range Infrastructure Construction. No effects would occur. The existing facilities should be adequate to accommodate any of these stationing scenarios.

Live-fire Training. With these stationing scenarios, the number of live-fire activity would increase. The added small arms fire on O'ahu that would be conducted semi-annually is not anticipated to have significant long-term effects to wildlife. The stationing of any of these scenarios would not introduce any new types of weapons systems, though the number of firing activities would increase. The increased use of individual and crew-served weapons and demolition materials (used by these types of units) would mean more noise generating live-fire events and could increase the potential for wildfire ignition. The effects from noise may be temporary as many animals will adapt to noise in their surroundings over time, and may become accustomed to regular noise (see the studies listed above). USAG-Hi would continue their fire mitigation measures (as are currently being implemented). These measures would be in place under all stationing scenarios.

Maneuver Training. Maneuver training under these stationing scenarios would impact vegetation, soils, wildlife, and may increase the risk of wildfires. Maneuver would occur within the footprint of existing training areas. CSS units would have limited impacts off-trails, roads, or other hardened surfaces. CS units would have a greater degree of impact on vegetation and wildlife communities due to the increased number from off-road maneuver and ground clearance activities. Because no new equipment types would be introduced to the training area, the noise associated with CS and CSS maneuver activities would be of the same intensity as is currently experienced, only the number of noise generating events would increase.

Under the scenario of stationing an aviation brigade in Hawai'i, additional studies of noise impacts may need to be conducted. There would be an increase in helicopters utilizing SBER and KLOA for tactical flight operations which may result in some short-term effects to wildlife. Long-term impacts could occur from an increase in helicopter flights at KLOA, depending on where flights would take place. Helicopter overflights could affect the endangered plants and snails found along the summit of the Koolaus. Endangered species may also be impacted from the spread of invasive species (introduction of seeds from increased Soldier and equipment movement). Downdraft from helicopters maneuvering near landing zones has the potential to directly affect trees hosting endangered snail species.

Large-scale maneuver associated with an aviation brigade would continue to be supported by PTA.

4.2.9 Wetlands

4.2.9.1 Affected Environment

USAG-HI has recently conducted wetlands delineation studies. Table 4.2-5 identifies the wetlands and waterbodies examined as a part of that wetlands study. More detailed 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 4.2-5. Summary of Wetlands and Waterbodies on USAG-HI Properties

Garrison Property and Wetland Type	Wetlands and	Likely Wetlands,	Regulated

	Waterbodies (acres)	not Delineated (acres)	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	31.0314	0.4001	1.9112
Ku Tree Dam & 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
Frog Pond	0.4154	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 (KTA)	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 (KLOA)	3.0361	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
Dillingham Military Reservation (DMR)	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 areas located on SBMP and eight located at SBER. At SBMP, one waterbody (Lake Wilson) is located at the upper reaches of Waikele stream (South Range); the second waterbody is near Mount Kaala at the installation's western boundary. Figure 4.2-5 below shows the location of Lake Wilson as compared to the South Range area.

1



Figure 4.2-5. Location of Lake Wilson (center of map) as compared to the SRAA

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 Winterra 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 these have not been verified; these include Peahinaia Pond, Lehua Makanoie 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 National Wetland Inventory (NWI) map; however, each lacked the three necessary criteria required by the 1987

COE 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 COE hydric indicators. The perched wetland may be subject to permitting by the COE, 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.

4.2.9.2 Environmental Consequences

CSS (1,000), CS (1,000), Combat Aviation Brigade (2,800), CSS (3,000), and CS (3,000): (Minimal).

Cantonment Construction. No wetlands will be impacted by proposed cantonment construction at SBMR as wetlands areas are not proximal to where the construction of a barracks and parking area may occur. Mitigations 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. Although surface water exists at WAAF, construction would take place in the footprint of previously disturbed cantonment area and is not anticipated to impact wetlands.

Training Range Infrastructure Construction. No effects would occur. The existing facilities should be adequate to accommodate any of these stationing scenarios.

Live-fire Training. Onion Pond (at KTA) is located more than two miles from where training may occur; additionally, live munitions are not used in this training area; therefore, no additional effects are expected. There are no wetlands in the vicinity of other live-fire areas located on O'ahu, therefore no effects are anticipated.

Maneuver Training. Maneuver training at SBMR (Mount Kaala) would avoid wetland areas, mitigating any short- or long-term effects. There are no wetlands in the vicinity of other maneuver areas on O'ahu that could be impacted by the Soldiers in these stationing scenarios.

4.2.10 Water Resources

4.2.10.1 Affected Environment

Watersheds

The ROI for these stationing scenarios involve 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 amsl both islands are relatively dry; conversely the maximum amount of rainfall occurs at elevations between 2,000 and 3,000 feet amsl. At SBMP, the average annual rainfall is 43.75 inches. Comparatively, WAAF has an average rainfall of 38 inches; SBEP 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 Kiiiki 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 WAAF, across land overlying the Waipahu-Waiawa aquifer system, and eventually discharges to the West Loch of Pearl Harbor.

WAAF is bounded by SBMR, Wahiawa Reservoir, the Kamehameha Highway, and Waikele Stream. Surface drainage from WAAF 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 Waikakalua 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 (30 miles). 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 WAAF. 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 Waialeale Gulch on the east. The headwaters of the Paumalu Stream are in the Pupukeya 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, the 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 Opaepala watershed. The Opaepala Reservoir is in the Anahulu watershed, but is recharged by diversions from the Kawaiiki and Opaepala streams via ditches or tunnels that cross the watershed boundaries. Southwest of the Opaepala Reservoir, Drum Road crosses the Opaepala watershed and the Opaepala 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 Opaepala watershed and the Helemanohi 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. Figure 4.2-6 below illustrates the watershed units found on O'ahu.

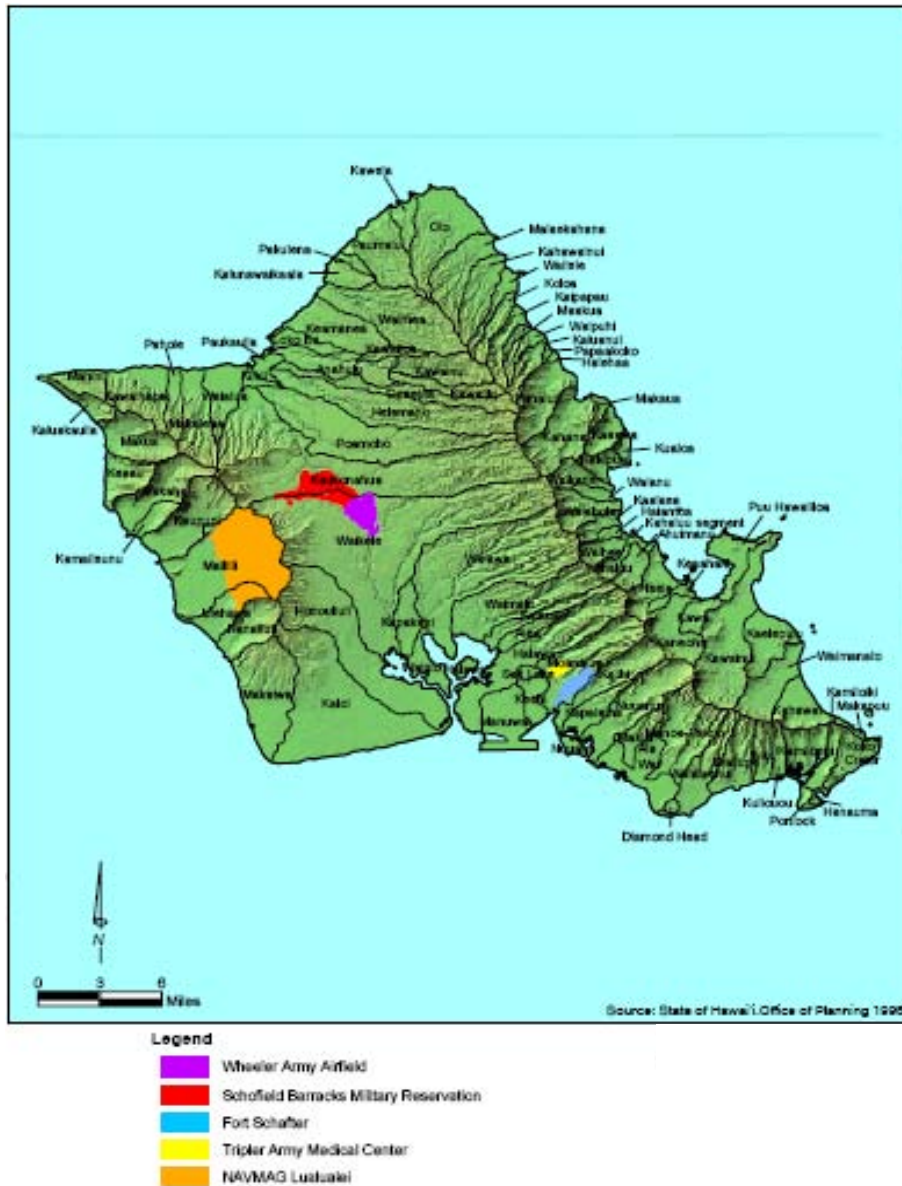


Figure 4.2-6. Figure Watershed units on the Island of O'ahu

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 WAAF by a well and water treatment facility located on SBMR. This facility produces and treats 4.0 to 9.0 MGD. The State of Hawai'i DLNR 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.

Wastewater

Wastewater treatment in Hawai'i is accomplished by wastewater treatment plants and by underground injection control. Wastewater is conveyed from SBMR to the treatment plant at WAAF using a gravity system. The WAAF plant is a secondary treatment facility that was constructed in 1976 and has been upgraded to a capacity of 4.2 MGD. 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 wastewater treatment plant has a design capacity of 4.2 MGD and processes an average daily flow of 2.6 MGD from the installation, WAAF, and other nearby Army facilities.

Stormwater

According to Hawai'i's 1998 305(b) report, most of the state's water bodies 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.

4.2.10.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. The addition of water transport and wastewater collection lines would be required to support cantonment construction at the South Range area. Utilizing existing infrastructure at SBMR, the installation would consider development of a 12 inch water line loop that would connect to the existing 20 inch line. The average water demand and flow may need to be modeled. Although a loop system is efficient, it may not have adequate flow demand to meet the requirements for fire protection systems (such as hydrants); therefore a fire water booster pump station may be considered.

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, sewage pump, and upgrades to lines feeding into the existing wastewater treatment plant). 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. Table 4.2-6 below identifies projected impacts to the current wastewater flow and capacity from each of the stationing scenarios.

Table 4.2-6. Projected Effects to Wastewater Flow and Capacity from Stationing Scenarios

Units	Number of Soldiers	Estimated per Capita Load (GPD)	Additional Sewer Daily Load (gal)	Additional Family (if est. 60% married & 3.2 per household)	Additional Load from Housing (GPD)
Combat Support or Combat Service Support	1,000	40	40,000	1,920	211,200
Combat Aviation Brigade	2,800	40	100,000	4,800	528,000
Combat Support or Combat Service Support	3,000	40	120,000	5,760	633,600

The extension of sewer services to the South Range area may have more adverse effects. The wastewater collection system that would be needed at South Range may need to include a conveying system (or pumping station), which would increase construction costs. Furthermore, it is suspected that the collection lines at Schofield Barracks and WAAF may currently be at their capacity (based on their diameter and the estimated amount of flow they currently support).

The wastewater treatment plant at Schofield Barracks may also require a major upgrade. As noted above, the wastewater treatment plant is designed for 4.2 MGD, however, the installation would consider an upgrade if the daily flow rate reaches 75 percent of the design flow (or 3.1 MGD) for the system. The addition of 1,000 or more Soldiers could conceivably result in an increased flow rate approaching 75 percent of the design flow capacity, especially as Soldiers are returning to Hawai'i when ending their deployment rotation overseas.

Lake Wilson 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 DOH 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 WAAF.

Long-term minor effects may occur due to water consumption. As indicated above, the water treatment facility supplying potable water to SBMR and WAAF is currently operating below capacity. There would be adequate potable water capacity to accommodate growth under these Soldier stationing scenarios.

Training Range Infrastructure Construction. Because training would continue to be supported on existing ranges, no new ranges would be needed. Therefore, no additional effects are anticipated.

1 *Live-fire Training.* The added throughput would increase lead and other materials on ranges.
2 Runoff from impacted berms and disrupted soils is possible as the added live-fire activity may
3 increase sediment transported to streams draining the ranges, and ultimately to surface waters
4 beyond the installation boundary. In the absence of mitigation, an increase in sediment erosion
5 could result in greater impacts, possibly in exceedances of health-based standards or
6 antidegradation policy goals. The Army has started an assessment of offsite potential for
7 contaminants at Schofield Barracks under the Operational Range Assessment Program
8 (ORAP). Samples of surface soils from selected areas on the training ranges were collected
9 and analyzed, and these data provide an indication of the concentrations of metals, semi-
10 volatile organic compounds, and explosive material in surface soils that could be transported to
11 surface water. While still in the early stages of the assessment, preliminary results show no
12 contamination of surface water. The installation's ITAM program monitors impacts from live-fire
13 activities and would continue to institute the required mitigations and BMPs (such as berm
14 revegetation and regrading) to minimize effects off the firing ranges. Other chemical pollutants,
15 such as petroleum hydrocarbon fuels or lubricants, may be indirect effects resulting from
16 vehicles parked at the training sites.

17
18 The risk of wildland fires is expected to remain at about the same level as under existing
19 conditions or slightly higher due to the increase in use of the MK-19 or explosive materials
20 associated with CS stationing scenarios. The potential for wildland fires is expected to be low
21 but could increase when the land is fallowed due to growth of grasses and other vegetation.
22 Wildland fires can generate chemical contaminants and loss of vegetation can increase the
23 potential for soil erosion and sediment loading to streams. Either of these effects could result in
24 adverse impacts on water quality.

25
26 *Maneuver Training.* Additional traffic on the range road network and stream crossings (at KTA,
27 SBER, or KLOA) during maneuvers may contribute to increased sedimentation and turbidity in
28 waterbodies. Efforts to reinforce stream crossings or monitor those areas for decreased water
29 quality may also be considered. Further, bivouac sites in the training area may also need to be
30 monitored and maintained more closely to ensure against stormwater runoff that may stem from
31 the effects of increased Soldier throughput in those areas.

32
33 Minor impacts would occur to wastewater and stormwater at DMR. The amount of additional
34 training there may not be substantial and would be supported by existing facilities. These areas
35 were to be improved to accommodate training from the 2/25th SBCT; these include drainage
36 improvements, culverts at stream crossings, grass and concrete swales, and drainage
37 structures and lines to manage stormwater runoff.

38
39
40 **Combat Aviation Brigade (2,800), CSS (3,000), CS (3,000): (Significant but Mitigable).**

41
42 *Cantonment Construction.* Effects from construction supporting these scenarios would be
43 greater than those identified under the 1,000 Soldier stationing scenarios. These units would
44 require more facilities and generate more wastewater and utilize more potable water. In
45 addition, cantonment construction at South Range would require more land (approximately 200
46 to 300 acres) which could have a greater degree of impact on surface water.

47
48 Construction at WAAF could result in runoff from the construction sites, and has the potential to
49 influence water quality from sediment entering the Wahiawa Reservoir or the Waikele Stream
50 (which could then drain to the Kamehameha Highway). The installation would continue

1 implement stormwater runoff controls in accordance with CWA regulations covering stormwater
2 runoff at construction sites.

3
4 *Training Range Infrastructure Construction.* Because training would continue to be supported
5 on existing ranges, no new ranges would be needed. Therefore, no additional effects are
6 anticipated.

7
8 *Live-fire Training.* The increase in weapons qualification training would increase lead and other
9 materials on ranges. Runoff from impacted berms and disrupted soils is possible as the added
10 live-fire activity may increase sediment transported to streams draining the ranges, and
11 ultimately to surface waters beyond the installation boundary. In the absence of mitigation, an
12 increase in sediment erosion could result in greater impacts, possibly in exceedances of health-
13 based standards or antidegradation policy goals. The Army has started an assessment of
14 offsite potential for contaminants at Schofield Barracks under the ORAP. Samples of surface
15 soils from selected areas on the training ranges were collected and analyzed, and these data
16 provide an indication of the concentrations of metals, semi-volatile organic compounds, and
17 explosive material in surface soils that could be transported to surface water. While still in the
18 early stages of the assessment, preliminary results show no contamination of surface water.
19 The installation's ITAM program monitors impacts from live-fire activities and would continue to
20 institute the required mitigations and BMPs (such as berm revegetation and regrading) to
21 minimize effects off the firing ranges. Other chemical pollutants, such as petroleum
22 hydrocarbon fuels or lubricants, may be indirect effects resulting from vehicles parked at the
23 training sites.

24
25 The risk of wildland fires is expected to remain at about the same level as under existing
26 conditions or slightly higher due to the increase in Soldiers using these ranges. The potential
27 for wildland fires is expected to be low but could increase when the land is fallowed due to
28 growth of grasses and other vegetation. Wildland fires can generate chemical contaminants,
29 and loss of vegetation can increase the potential for soil erosion and sediment loading to
30 streams resulting in impacts to water quality.

31
32 Aerial gunnery live-fire is addressed within the Chapter for PTA.

33
34 *Maneuver Training.* Additional traffic on the range road network and stream crossings (at KTA,
35 SBER, or KLOA) during maneuvers may contribute to increased sedimentation and turbidity in
36 waterbodies. Efforts to reinforce stream crossings or monitor those areas for decreased water
37 quality may also be considered. Further, bivouac sites in the training area may also need to be
38 monitored and maintained more closely to ensure against stormwater runoff that may stem from
39 the effects of increased Soldier throughput in those areas.

40
41 Minor impacts would occur to wastewater and stormwater at DMR. The amount of additional
42 training there may not be substantial and would be supported by existing facilities. These areas
43 are to be improved to accommodate training from the 2/25th SBCT; these include drainage
44 improvements, culverts at stream crossings, grass and concrete swales, and drainage
45 structures and lines to manage stormwater runoff.

46
47 The increase in frequency of helicopter maneuvers at KLOA and SBER may increase sediment
48 inputs into surface waters as a result of denuded vegetation from helicopter maneuvers at
49 landing zones.

4.2.11 Facilities

4.2.11.1 Affected Environment

“Facilities” encompasses all aspects of Army real property management including land, facilities, and infrastructure such as Soldier and Family services (child care, chapel) and police and fire. Furthermore this includes interests in land, leaseholds, standing timber, buildings, improvements, and appurtenances. Facilities are the buildings, structures, and other improvements that support the Army’s mission. Infrastructure is the combination of supporting systems that enable the use of this land and resident facilities. The Army holds real estate in every state. The variety of locations provides the Army with installations having terrain with the characteristics of the key environments of deserts, the arctic, jungles, and mountains. The Army’s installations also contain lands that are classifiable as swamp/wetland, forest, open woodland/savanna, grassland prairie, and semi-arid shrub/steppe. Infrastructure enables the use of Army land assets and facilities; these include utilities such as gas, power, and telecommunications; and roadways and other transportation infrastructure such as rail.

To manage land, facilities, and infrastructure, USAG-HI has prepared a real property management plan. Army Regulation 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. The actions involving stationing scenarios described within this document (if implemented at USAG-HI) would occur on land currently owned by the federal government.

4.2.11.2 Environmental Consequences

CSS (1,000), CS (1,000): (Minimal).

Cantonment Construction. Existing facilities in USAG-HI are not capable of supporting additional Soldier stationing under these scenarios. New administrative and living space would need to be established. These facilities would need to be tied in to existing infrastructure (water lines, wastewater transport, power transmission, etc.). There is adequate land available at South Range to accommodate construction for these stationing scenarios.

Construction of a barracks at SBMP would occur as infill (built among existing structures and infrastructure) with demolition of existing facilities in the cantonment area; no new infrastructure (such as power and water) would need to be developed.

Training Range Infrastructure Construction. Training would occur on existing range facilities, therefore no expansion is required and no effects are anticipated.

Live-fire Training. No additional impacts.

Maneuver Training. No additional impacts.

CSS (3,000), CS (3,000): (Less than Significant).

Cantonment Construction. Existing facilities in USAG-HI are not capable of supporting additional Soldier stationing under these scenarios. New administrative and living space would

1 need to be established. These facilities would need to be tied in to existing infrastructure (water
2 lines, wastewater transport, power transmission, etc.). There is adequate land available at
3 South Range to accommodate construction for these stationing scenarios; however, due to the
4 number of Soldiers (and potential Family members) associated with these scenarios, the
5 construction footprint at South Range could encompass an estimated 200 to 300 acres. Water
6 demand, sewage treatment requirements, and power demand would increase by a factor of
7 three in comparison with the 1,000 Soldier stationing scenarios. If any of these scenarios are
8 selected, additional studies of facilities capacity would need to be conducted to ensure
9 adequate facilities requirements are met. Due to the availability of space at South Range, the
10 impacts from construction of new facilities is anticipated to be less than significant.

11
12 *Training Range Infrastructure Construction.* Training would occur on existing range facilities,
13 therefore no expansion is required and no effects are anticipated.

14
15 *Live-fire Training and Maneuver Training.* Where water utilities are not currently available (KTA
16 and KLOA) additional potable water may need to be trucked in to support the increase in
17 maneuver/training activity there. There are no plans to extend water utilities to those areas
18 therefore the impact would continue to be minimal. Other support infrastructure at training sites
19 is adequate to accommodate these stationing scenarios.

20 21 22 **Combat Aviation Brigade (2,800): (Significant but Mitigable to Less than Significant).**

23
24 *Cantonment Construction.* Existing facilities in USAG-HI are not capable of supporting
25 additional Soldier stationing under these scenarios. New administrative and living space would
26 need to be established. These facilities would need to be tied in to existing infrastructure (water
27 lines, wastewater transport, power transmission, etc.). There is adequate land available at
28 South Range to accommodate construction for these stationing scenarios. Due to the number
29 of Soldiers (and potential Family members) associated with these scenarios, the construction
30 footprint at South Range could encompass an estimated 200 to 300 acres. Water demand,
31 sewage treatment requirements, and power demand would increase by a factor of three in
32 comparison with the 1,000 Soldier stationing scenarios. If any of these scenarios are selected,
33 additional studies of facilities capacity would need to be conducted to ensure adequate facilities
34 requirements.

35
36 This scenario involves additional facilities requirements at WAAF. Aircraft maintenance
37 requirements would increase the demand for water and power for additional hangars that would
38 be constructed at WAAF. The airfield does not have adequate enough facilities to provide for
39 the additional helicopters associated with a brigade-level unit. Due to space constraints at
40 WAAF, siting of new hangars and other facilities may occur within the footprint of existing
41 facilities. This option may require some functions (currently at WAAF) to be relocated to
42 Schofield Barracks, or possibly to South Range. USAG-HI would need to conduct further
43 planning studies in order to determine the feasibility, potential impacts, and reasonable
44 alternatives to potential CAB stationing locations. Due to the availability of land and resources
45 at Schofield Barracks and South Range, the impacts are expected to be significant but mitigable
46 to less than significant.

47
48 *Training Range Infrastructure Construction.* Training would occur on existing range facilities,
49 therefore no expansion is required and no effects are anticipated.

50
51 Aerial gunnery range upgrade requirements are discussed in Chapter 4.4 PTA.

Minimal effects to O'ahu maneuver sites are anticipated. No new range infrastructure to support tactical flights is necessary. The reinforcement of existing landing zones would have minor effects as only a minimal amount of equipment and workers would be required, and because the landing zones are previously disturbed from current use.

Live-fire Training and Maneuver Training. Where water utilities are not currently available (KTA and KLOA) additional potable water may need to be trucked in to support the increase in maneuver/training activity there. There are no plans to extend water utilities to those areas therefore the impact would continue to be minimal. Other support infrastructure at training sites is adequate to accommodate these stationing scenarios.

Live-fire aerial gunnery range requirements are discussed in Chapter 4.4 PTA.

4.2.12 Energy Demand and Generation

4.2.12.1 Affected Environment

Electrical power to the O'ahu is supplied from the Hawaiian Electric and Light Company (HELCO). 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 to each island's power supply. To meet rising demand and future demands, the power company is planning construction of a new facility that will generate approximately 100 megawatts per year. The facility is expected to be fully operational in 2009.

Schofield Barracks is presently serviced by two substations, these are Castner and Menoher; both are provided energy from HELCO 46 kV circuits. One of these lines presently runs through the South Range Acquisition Area.

The USAG-HI continues efforts to reduce power demand by implementing energy conservation methods, including promoting the use of photovoltaic lighting where feasible, and examining renewable sources of energy production.

4.2.12.2 Environmental Consequences

CSS (1,000), CS (1,000), Combat Aviation Brigade (2,800), CSS (3,000), CS (3,000): (Less than Significant).

Cantonment Construction. Long-term effects are anticipated. These scenarios would result in a greater demand on energy usage at SBMR. Construction of new facilities at South Range would require the addition of a new sub-station to supply new facilities in South Range with power.

Training Range Infrastructure Construction. Training would occur on existing range facilities, therefore no expansion is required and no effects are anticipated.

Live-Fire Training. Live-fire training would increase under these stationing actions; and the addition of a firing range would add demand to the power supply; however, impacts from energy

use are expected to be less than significant as the power required by live-fire facilities is minimal compared to other facility types (such as housing or headquarters buildings).

Maneuver Training. Maneuver training would increase under this alternative; however, impacts to energy use and costs are expected to be less than significant. During maneuver training units power generation is typically self-contained (generators) and does not tap into existing power infrastructure.

4.2.13 Land Use Conflict/Compatibility

4.2.13.1 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)). For informational purposes, the descriptions of existing land uses in this section include the State Land Use District designations. These designations list all lands in one of four districts: Conservation, Agriculture, Urban, or Rural (State of Hawaii 2002a). Conservation District Subzone designations, regulated by HDLNR, are Protective, Limited, Resource, General, and Special. The state designations for Agricultural Lands of Importance to the State of Hawai'i (ALISH) categorize agricultural land as Prime, Unique, or other.

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 WAAF; 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 WAAF.

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 hunting, 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). WAAF lies to the southeast of the main post. North of SBMR is the Kaala Natural Area Reserve. To the south lies South Range, the Honouliuli Preserve, Military Field Station Kunia, and the Naval Magazine Pearl Harbor Lualualei Branch. A land use plan for Schofield Barracks is illustrated in Figure 4.2-7.

South Range (located below Schofield Barracks in Figure 4.2-7) consists of 1,402 acres and provides for small-arms live-fire qualification. Currently sited at South Range is a qualification training range and a motorpool. 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; pineapple agriculture continues to

the south; the Honouliuli Preserve to the west; and Field Station Kunia and WAAF is located to the east. As a result of permanently stationing the 2/25th SBCT, one new maneuver area would be utilized at South Range to accommodate 2/25th SBCT and would be available to support other training activities. Additionally, approximately 535 acres of actively cultivated pineapple land within South Range is to be converted to training land.

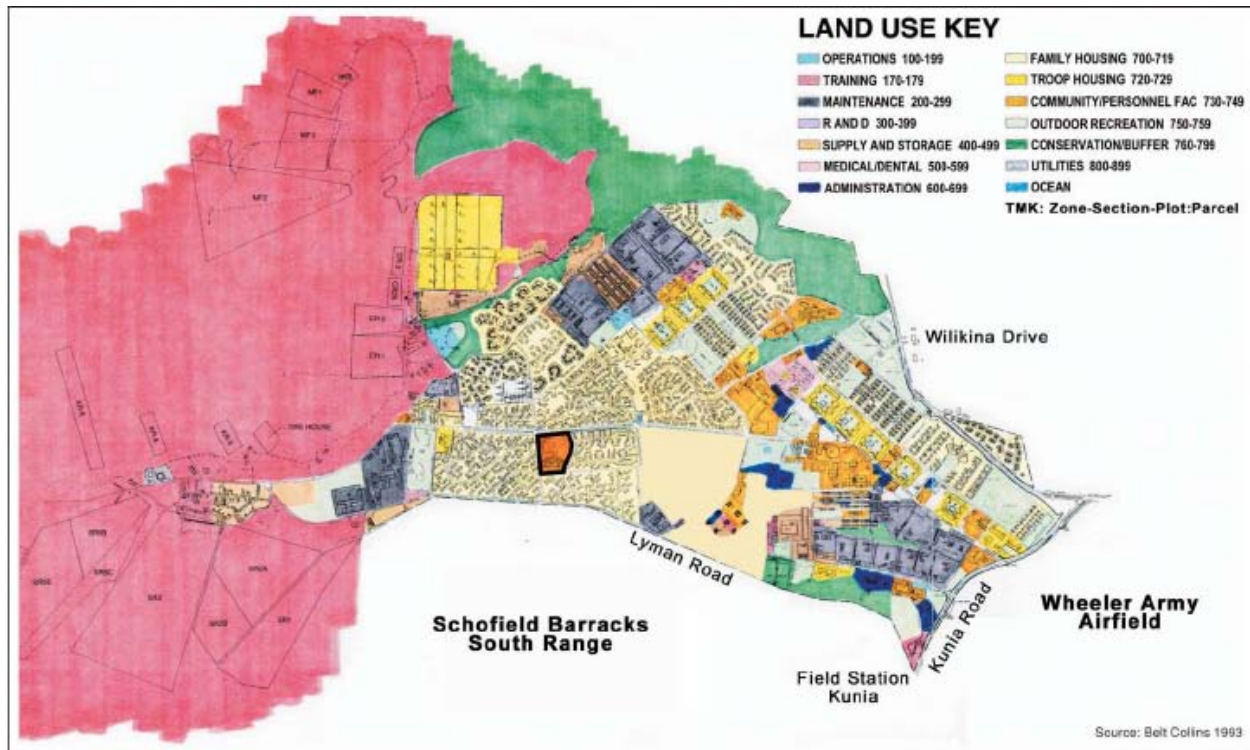


Figure 4.2-7. Land use plan for SBMR (August 2006)

WAAF has 1,369 acres and provides for housing and administration (provided at both Wheeler and SBMR), maintenance, and training and flight facilities. Parts of WAAF have been designated agricultural and urban districts. The installation allows no hiking or hunting there. A land use plan for WAAF is depicted as Figure 4.2-8 on the next page.

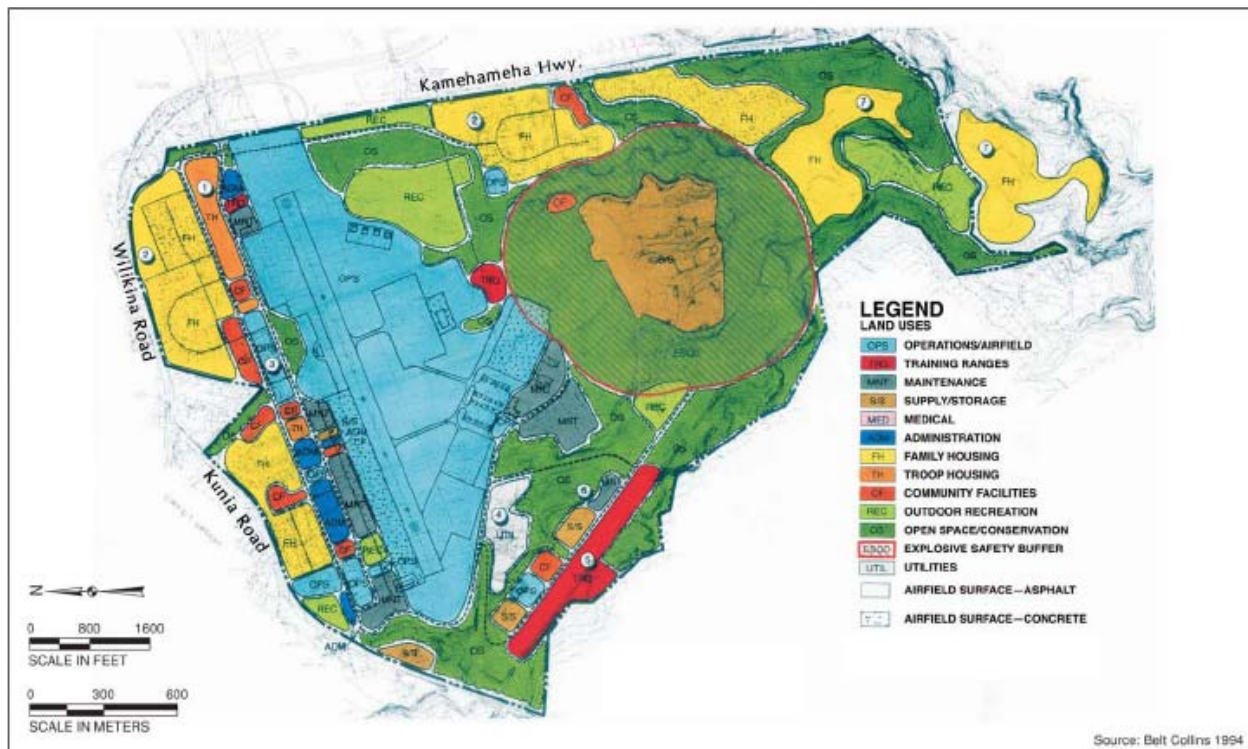


Figure 4.2-8. Land Use Plan for Wheeler Army Airfield (August 2006)

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 hunting, biking, and hiking. Located to the south and southwest of KTA is KLOA; agricultural land and forest to the southeast; Pupukeya Paumalu Homesteads, Camp Paumalu, and the Pupukeya 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. SRTA 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 SDZ 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 to when SDZs are active.

KLOA has 23,348 acres of land that is used for helicopter training, maneuver, mountain and jungle warfare, and small infantry maneuver. Approximately only 5,310 acres of the training area is adequate for maneuver training; and lease agreements promote conservation of

resources by preventing 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 therefore 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.

4.2.13.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Long-term effects are anticipated. As indicated previously, part of South Range was actively cultivated pineapple land or open land. While a part of the South Range is used as training land, the Army would need to plan construction of Soldier and Family housing, supply/storage, and administrative facilities to accommodate growth at Schofield Barracks. The area identified that may accommodate growth at South Range would be dependent on the number and size of the units being stationed at USAG-HI. As indicated in Chapter 4.1 (Scenarios), the requirements for 1,000 Soldiers may be 80 to 100 acres. There may be short-term effects to surrounding land uses from construction noise and activities that create dust.

Construction of a new barracks at SBMP would have only temporary effects to surrounding land uses due to construction noise and dust. Because the duration of construction may last only 12-24 months, the effects are expected to be less than significant.

Training Range Infrastructure Construction. No range construction is expected to accommodate 1,000 CS or CSS Soldiers. Therefore, no effects are anticipated.

Live-Fire Training. Long-term minor effects are anticipated. The increase in Soldiers training on live-fire ranges at South Range and SBMR may drive the need to schedule some training activities at night, which could effect nearby Soldier and Family housing.

Increased noise, dust, or other indirect effects associated with this alternative are not expected to affect off-post land uses. The increase in live-fire activities would increase restrictions on public access to the training area. As other areas on- and surrounding the installation would remain available for recreational access, the effects are anticipated to be less than significant.

Maneuver Training. Similar to live-fire training, there would be an increase in Soldiers utilizing maneuver areas across O'ahu training sites; which would result in an increase in maneuver training events. The increased training may result in additional restrictions on recreational access. As other areas on- and surrounding the installation would remain available for recreational access, the effects are anticipated to be less than significant. Implementation of these stationing scenarios is not anticipated to have direct effects to off-post land uses.

CSS (3,000), CS (3,000): (Significant but Mitigable to Less than Significant).

Cantonment Construction. Under these stationing scenarios the amount of Soldiers requiring housing and facilities would, in-turn, increase the amount of land at South Range that would be required for construction. The installation may anticipate construction in an area of South Range of between 200 and 300 acres. Short-term compatibility effects from construction noise and dust may occur to nearby land uses (recreational, training, or other).

Long-term effects are also anticipated. Soldier and Family housing, and other facilities that would be constructed at South Range could be located near training areas at South Range. Proper siting of housing units would strive to minimize compatibility conflicts with existing training activities. Planning, combined with the use of noise mitigation measures against training activities is anticipated to result in less than significant long-term effects.

Training Range Infrastructure Construction. No range construction is anticipated to support these stationing scenarios; therefore, no effects are expected.

Live-fire Training. Long-term effects may occur. There would be an expected appreciable increase in training on existing ranges. The installation would continue to ensure protection of human safety by restricting access to live-fire areas during training events. Military activities, training, and restriction areas would be confined within the boundaries of existing ranges and would not affect land uses outside the installation boundary. Disturbed areas (agricultural fields and roads) would continue to be used for walking and driving between locations.

Maneuver Training. Maneuver training would continue to occur within the boundaries of existing Army lands. The frequency of these events would increase; however these uses would continue to be compatible with adjacent land uses. Public access to maneuver areas would be limited to the increased extent that the land is utilized for training.

Short- or long-term changes in ambient conditions, such as increased noise, dust or odors, or adverse effects on public views, may result in direct or indirect effects to land uses or quality of recreation in the vicinity of the maneuver training area. Smaller unit training would continue to be supported at sites on O'ahu; however larger-scale training events would occur at PTA, those effects may be discussed in Chapter 4.4.

Combat Aviation Brigade (2,800): (Significant but Mitigable to Less than Significant).

Cantonment Construction. Construction to accommodate Soldiers at South Range and SBMR would have similar effects to CS or CSS (3,000 Soldier) stationing scenarios. Short-term effects may occur from construction noise and dust; and long-term effects may occur due to siting of facilities in relation to training activities at South Range. The amount of land at South Range required for construction is estimated to be between 200 and 300 acres. The installation would need to ensure proper siting of housing to minimize compatibility conflicts.

Due to the lack of available space (e.g., hangars or equipment storage) at WAAF (Figure 4.1-3), construction may be considered at an area within the footprint of existing facilities. This may require USAG-HI to consider relocating activities from WAAF to Schofield Barracks or South Range in order to accommodate aviation facilities at WAAF. Further analysis and planning studies would be required. Siting new CAB facilities at WAAF and relocating some existing functions/facilities to Schofield Barracks may reduce potential land use conflicts at WAAF to less than significant.

Training Range Infrastructure Construction. No range construction may be required to support these stationing scenarios; therefore, no effects are anticipated.

The reinforcement of tactical landing zones supporting tactical flight training at SBMR or KLOA would be minor in nature, resulting in no additional effects to land use at these areas.

Live-fire Training. Long-term effects would occur. There would be an expected appreciable increase in training on existing ranges. The installation would continue to ensure protection of human safety by restricting access to live-fire areas during training events. Military activities, training, and restriction areas would be confined within the boundaries of existing ranges and would not affect land uses outside the installation boundary. Disturbed areas (agricultural fields and roads) would continue to be used for walking and driving between locations.

Activities involving aerial gunnery will be discussed in Chapter 4.4 PTA.

Maneuver Training. Maneuver operations (tactical flight operations) would continue to be supported as needed at the SBMR or KLOA training areas. The frequency of maneuver operations would increase, but no new maneuver uses would cause any additional land use or recreation conflicts.

Impacts to airspace under this scenario were discussed in Chapter 4.2.2.

4.2.14 Hazardous Material/Hazardous Waste

4.2.14.1 Affected Environment

Hazardous waste at the USAG-HI is tracked and grouped into the following categories according to how they are generated: Ammunition, Live-fire, and UXO; Petroleum, Oils, Lubricants (POL), and Storage Tanks; Contaminated and Installation Restoration Program (IRP) sites; Lead; Asbestos; PCBs; Pesticides and Herbicides; Radon; and Hazardous Wastes.

Ammunition, Live-fire, and UXO: Live-fire training associated with these stationing scenarios could include spent cartridges, shell casings, and munitions, including the generation of dud and unexploded ordnance (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

1 storage facilities. Each training area is restricted from public access and maintains surface
2 danger zones (SDZ) that establish the limits to which Soldiers or range operators may approach
3 detonation points during training. SBMR's SDZs exist roughly within an arc formed by Area X
4 (the eastern boundary), Trimble Road (the southern boundary), and the Waianae Mountain
5 Range (the western boundary). The direction of fire is generally west to north. The area
6 supports small arms, mortar, and artillery training. No live tube-launched, optically tracked, wire-
7 guided missile, air-to-ground, or ground-to-air firing is conducted at the SBMR ranges (Belt
8 Collins 1993). In recent years, there have been no problems involving the public and the
9 storage, transportation, and use of ammunition for training at SBMR (USAG-HI 2004). Unused
10 ammunition is turned back into the ammunition storage point for later use.

11
12 There are no live-fire areas at WAAF; however, the airfield has an ammunition storage point
13 with an established explosive safety quantity-distance arc. The safety arc around the
14 ammunition storage point is in the south-central portion of the installation. Explosives quantity
15 distance regulations (TM 9-1300-206) are imposed on ammunition storage facilities for the
16 safety of personnel and supplies. All explosives and ammunition are stored within the ASP on
17 WAAF under the supervision of the US Army Support Command, Hawai'i Directorate of
18 Logistics (DOL). During 8 or 9 months of the year, ammunition is brought from WAAF or
19 Lualualei to PTA via boat or helicopter (USAG-HI 2004). If boats are used, the ammunition is
20 driven from Kawaihae Harbor to PTA. There have been no accidents involving the transport of
21 ammunition in the last 5 years.

22
23 In addition, non-live-fire training occurs on SBER, South Range, DMR, KTA, and KLOA.
24 Exercises at SBER use pyrotechnics and blank ammunition, and no live-fire exercises occur at
25 SBER; therefore, no surface danger zones exist because the range is used for bivouac,
26 maneuver, and dummy fire training activities.

27
28 Results from recent soil sampling of SBMR ranges produced some samples with levels above
29 USEPA Region IX residential and industrial PRGs. At SBMR, two samples for RDX and one
30 sample for nitroglycerin slightly exceeded the industrial PRG, but the level of exposure on a
31 range (days or weeks) compared with the level of exposure used to calculate an industrial PRG
32 (25 years) minimizes the concern. Although metals such as aluminum and iron occur naturally
33 in Hawaiian soils, byproducts of munitions, such as lead and RDX, contribute contaminants that
34 could create health and safety concerns in the natural environment. Hazardous waste is
35 transferred to the SBMR transfer and accumulation point facilities, as appropriate, for proper
36 storage until disposal contractors and the defense reutilization and marketing office (DRMO)
37 coordinate to ensure proper disposal.

38
39 **Petroleum, Oils, Lubricants (POL), and Storage Tanks:** Industrial operations responsible for
40 POL are generally centralized in motor pools. Industrial grade fuel is generally transported from
41 Hickham AFB and stored in aboveground storage tanks (AST); and Army & Air Force Exchange
42 Service (AAFES) filling stations are located at Schofield Barracks. There is currently only one
43 underground storage tank (UST) in use at KTA. SBMR and WAAF contain several in-use and
44 permanently out-of-use USTs. SBMR maintains 18 motorpools where several ASTs are used to
45 store fuel and propane. WAAF also maintains several ASTs for diesel or aviation fuel use. For
46 both DMR and KTA, only one UST remains in use at each area. There is one AST known to
47 exist at KTA for propane storage. USAG-HI currently maintains and uses oil/water separators
48 throughout the garrison, where needed, with the exception of on KTA, or PTA.

49
50 **Installation Restoration Program (IRP) Sites:** There are several sites identified on SBMR
51 and WAAF. No sites are identified at KTA. Explosive compounds have been found in surface

1 soil and water samples at SBMR, as have metals including iron, lead, antimony, and aluminum,
2 and semi-volatile organic compounds. Trichloroethylene (TCE) had previously been discovered
3 in four wells supplying potable water to SBMR. The TCE exceeded regulatory limits and thus
4 SBMR was placed on the EPA's National Priorities List (NPL); which has since been remediated
5 (and removed from NPL in 2000).
6

7 The last fully recorded surface soil investigation (to establish baseline conditions for human
8 health assessments for range exposure) was conducted by the U.S. Army Corps of Engineers
9 (USACE) between November 8 and November 10, 2002; and covered the following areas:
10 SBMR, KTA, KLOA, and DMR. Soil samples were taken during this time from a variety of
11 locations across the garrison. The USACE compared soil constituent concentrations with EPA
12 PRGs for industrial soils with the goal of identifying current soil conditions and to determine if
13 these conditions are consistent with acceptable exposure rates. It was noted that most
14 personnel use the training ranges in Hawai'i for only brief periods of time, totaling approximately
15 days or weeks (over the course of one year), therefore it is assumed that exposures to potential
16 contaminants there are far lower than what would be assumed in the industrial soil PRGs. The
17 study revealed that three classes of materials were generally present as soil constituents; these
18 were metals, explosives, and semi-volatile organic compounds (SVOCs).
19

20 Depleted Uranium (DU) was found in August 2005 during the cleanup of unexploded ordnance
21 (UXO) from a range located on SBMR. Follow-up surveys identified other locations where DU
22 was found. The source of this DU was determined to be tail fin sections of Spotting Rounds for
23 the Davy Crockett Weapons System. The Army is continuing to work with the State of Hawai'i
24 to fully investigate this issue.
25

26 **Lead:** The results of lead surveys for facilities at USAG-HI are available through the Army's
27 Department of Public Works for SBMR, WAAF, and KTA. Lead can also be found in live-fire
28 areas of SBMR; but the garrison has in place best management practices as provided by the
29 Army for lead mitigation and erosion at small arms ranges.
30

31 **Asbestos:** All buildings constructed prior to 1980 are suspected risks for asbestos, and upon
32 identification of renovation or demolition projects these buildings are surveyed for asbestos-
33 containing material.
34

35 **PCBs:** PCBs are found in cooling fluid of electrical equipment, fire retardants, and other solid
36 materials. The USAG-HI has a proactive program for removing and refilling electrical
37 equipment containing regulated amounts of dielectric fluid containing PCBs. Such equipment is
38 found throughout Schofield Barracks, and in some locations on KTA.
39

40 **Pesticides and Herbicides:** These materials are commonly used throughout the army at
41 USAG-HI installations to prevent and mitigate pest-related health problems and maintain
42 grounds and structures. These materials are currently stored in four locations on SBMR and
43 one location on KTA in approved containers.
44

45 Due to the agricultural nature of South Range, there is suspected pesticides persisting within
46 the soils. Further evaluation is pending.
47

48 **Radon:** Radon is naturally occurring in low concentrations in the Hawai'ian Islands and has
49 been evaluated in both Honolulu and Hawai'i Counties. Though radon has been associated
50 with an increase risk of lung cancer, current samples throughout the Hawai'ian Islands are lower

than EPS's recommended action level of 4 picocuries per liter, and thus there is not much concern at this location.

Hazardous Wastes/Biomedical Waste: Most of the motorpools at Schofield Barracks are also designated as waste storage and holding areas, with primary and secondary containment for wastes generated by vehicle servicing and shop areas. Wastes are temporarily collected and stored in areas of the motorpools with secondary containment and separated out. Biomedical waste is collected and disposed of in accordance with AR 200-1.

4.2.14.2 Environmental Consequences

CSS (1,000), CS (1,000), Combat Aviation Brigade (2,800), CSS (3,000), CS (3,000): (Minor).

Cantonment Construction. Temporary effects may occur. No asbestos or lead would be used in the construction of new facilities, and the installation would ensure mitigations are in place for radon. Under these scenarios, the requirement for motorpools would be coupled as hazardous materials collection sites for POLs. The additional tactical and fleet vehicles may require additional ASTs/USTs, wash racks, and thus oil-water separators. Similar effects would occur at WAAF to accommodate the additional helicopters and equipment associated with the MFAB.

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 aircraft associated with the CAB scenario would generate more POLs than would vehicles associated with other stationing scenarios, however, the quantities is not anticipated to exceed thresholds under the garrison's hazardous waste permits, resulting in minor effects.

Training Range Infrastructure Construction. These stationing scenarios would not require construction of new range infrastructure. USAG-HI existing facilities would be able to meet these units' training needs through the use of existing or planned range projects.

Range expansion supporting the Aviation Brigade is discussed in the analysis for PTA.

Additionally, reinforcement of landing zones supporting aircraft tactical maneuver may occur at SBER or KLOA. These reinforcement measures could involve potential POL spills during construction..

1
2 *Live-fire Training.* Long-term effects are expected. All of these scenarios would increase the
3 frequency of Soldier live-fire training on ranges at SBMR and South Range; thus increasing the
4 amount of lead bullets and other munitions expended in the range area. Live-fire small arms
5 ranges would retain their berms to stop projectiles fired at the ranges. Although more lead from
6 live-fire activities would be fired into impact berms, the installation has mitigation measures in
7 place to ensure berms are well maintained and re-graded as needed.

8
9 DUD items may also be produced from the use of the MK-19 grenade machine gun. Activities
10 supported by combat engineers or EOD units may train with explosive material. The use of
11 explosive material would be consistent with current uses, and would not pose a significant
12 impact to human health or the environment as these materials would be consumed, stored, or
13 disposed of in accordance with all appropriate safety regulations.

14
15 No new weapon types may be introduced to training areas there. The amount of ammunition
16 required however may not exceed the ammunition storage capacity in these areas; and
17 handling and storage methods, disposal protocols, and safety procedures would continue to be
18 conducted in accordance with existing regulations.

19
20 *Maneuver Training.* Maneuver training associated with these scenarios would continue to be
21 conducted in existing training locations including KTA, KLOA, DMR, SBER, SBMR and South
22 Range. Transportation of personnel and use of flammable or combustible materials, such as
23 fuel or ordnance (i.e., weaponry or equipment), could increase the potential for spills or releases
24 of hazardous materials, especially in areas not previously used frequently. Best management
25 practices would be practiced at each of these proposed facilities, and project area personnel
26 would follow USEPA and USAG-HI protocol for using and handling hazardous materials, such
27 as POLs. Each facility maintains strict SOPs and spill contingency plans for hazardous materials
28 and waste, identifying specific operating responsibilities and procedures. Spill prevention
29 control countermeasure plans would be updated to reflect changes implemented as part of
30 stationing scenarios.

31 32 33 34 **4.2.15 Traffic and Transportation**

35 **4.2.15.1 Affected Environment**

36
37 Traffic on O'ahu extends largely from urban development in southern coastal areas from Ewa
38 on the west of the island to Hawai'i Kai to the east. The Island of O'ahu has four freeways,
39 State Road 78, H-1, H-2, and H-3. State Road 78 (aka Moanalua Road) functions as a bypass
40 for H-1 (Lunalilo Freeway), which spans the south portion of the island connecting the Ewa area
41 with Hawai'i Kai. H-2 connects the Ewa area with the central portion of the island (where
42 Schofield Barracks is located) and connects with H-1 to east of Honolulu. H-3 connects Pearl
43 Harbor with Kaneohe Bay Marine Corps Airfield at the northeast portion of the island. The other
44 state highways make up roughly 200 lane-miles of roadway; and the city and county of Honolulu
45 contain approximately 1,200 lane-miles of roadway.

46
47 Very few roads connect the northern and southern portions of O'ahu (separated by the Koolau
48 Mountains); these are Pali Highway, Likelike Highway, and H-3. The Kalaniana'ole highway
49 traverses through the east coastline between Hawai'i Kai and Kailua. H-2 and Kamehameha
50 Highway traverses the western portion of the Koolau Range and connects Honolulu with Mililani,
51 Wahiawa, Schofield Barracks, and Haleiwa. The training areas around Schofield Barracks are

1 primarily accessed through the Kamehameha Highway and Kunia Road (from Ewa), and
2 Kamananui Road and Wilikina Drive (from the North Shore). Vehicle traffic on Schofield
3 Barracks is contained primarily through Trimble and Lyman Roads, and Kolekole Avenue.
4 Circulation routes through KTA are contained primarily through Drum Road and Kamehameha
5 Highway.

6
7 There is already a loss-of-service on- and off-post due to current local and commuter traffic.
8 Mornings and afternoon commutes tend to experience the heaviest traffic flow. There is also an
9 increased flow of traffic around noon, when installation personnel travel to various on-post
10 dining facilities for lunch. Additionally, a key existing traffic circulation issue for SBMR is
11 excessive traffic through housing areas, which degrades the quality of life and increases the risk
12 to pedestrians and cyclists.

13
14 The ROI for Schofield Barracks and the O'ahu Training Sites are as follows:

15
16 SBMR – within the perimeter of SBMR and WAAF, and Kunia Road, Kamehameha Highway,
17 and Wilikina Road;

18
19 DMR – the corridor between SBMR and DMR, which includes the area from central O'ahu to
20 DMR (northwest area of the island);

21
22 KTA – this consists of Drum Road, the corridor extending from SBMR (central O'ahu) to KTA
23 (the windward side of O'ahu).

24 25 26 **4.2.15.2 Environmental Consequences**

27
28 **CSS (1,000), CS (1,000), Combat Aviation Brigade (2,800), CSS (3,000), CS (3,000): (Less**
29 **than Significant to Significant but Mitigable).**

30
31 With each of these stationing scenarios, anticipated impacts would include an increase in traffic
32 from construction equipment; transportation of Soldiers between their home station and training
33 areas. Traffic would also increase from Soldier (and Family) POVs and commuters. During
34 peak commuter hours (including the noon lunch hour) the roads on- and around SBMR and
35 South Range may need to accommodate an additional 800 to 2,400 vehicles as approximately
36 50 percent of Soldiers and their Families are estimated to use these roads during these times.

37
38 *Cantonment Construction.* Short-term effects are anticipated. Impacts would include additional
39 traffic from worker vehicles and trucks and a possible reduction in available parking adjacent to
40 the construction site (for construction at SBMP). These effects are anticipated to last the
41 duration of construction projects. The project-related construction traffic is not anticipated to
42 significantly affect operations at post intersections and street segments in the project vicinity.
43 Traffic may generally remain free flowing. Due to the temporary nature of the project, impacts
44 from construction traffic at SBMP are anticipated to be less than significant.

45
46 Construction at South Range would consist of Soldier and Family housing, administrative
47 buildings, and other facilities. To support new facilities, South Range would require the
48 development of new access and egress routes to the new facilities; improvements to the
49 existing cantonment area road network; an extension of roads and streets in the existing
50 cantonment area; and emergency access and fire-break gravel roadways. Although the
51 construction projects would be many, these would be temporary, lasting only the duration of

1 construction. Due to the nature of construction, large equipment would enter, stay on-site (as
2 needed), and leave or be transported from the construction site(s) in phases. Because of the
3 current lack of activity at South Range (relative to SBMP), coupled with the effects from
4 construction traffic to on-post activities, the anticipated level of impact from construction is less
5 than significant.

6
7 Construction at WAAF to accommodate CAB equipment and helicopter hangars is also
8 expected to have short-term effects during the planned construction period. The level of impact
9 would be determined by the location of proposed facility siting, whether existing facilities would
10 need to be re-located (resulting in an increased demolition/construction time), and the scale of
11 the construction site.

12
13 The long-term effects would be expected from an increase in Soldiers stationed at SBMR and
14 South Range, which would have direct effects to traffic conditions on- and off-post. The addition
15 of new barracks on-post would be beneficial to off-post conditions by minimizing movement of
16 traffic from new personnel (and Families) to off-post locations. The added Soldiers and Family
17 members may result in significant impacts to on- and off-post locations. A new traffic study may
18 be required by the installation to more accurately determine the level of impacts, and identify
19 mitigations to lessen the potential affects of stationing new Soldiers at SBMR.

20
21 The Army currently operates a public web site (<http://www.25idl.army.mil>) that lists a schedule of
22 upcoming USAG-HI activities including training and public involvement projects. Subject to
23 force protection measures and other security measures, the site would contain USAG-HI
24 training and convoy schedules, community projects in which the USAG-HI is involved, USAG-HI
25 activities and functions, general USAG-HI news that might be of interest to the public, and
26 USAG-HI services available to the public.

27
28 Off-post traffic construction projects are listed in Chapter 4.7 Cumulative Effects.

29
30 *Training Range Infrastructure Construction.* No new range construction is anticipated to support
31 these stationing scenarios. No effects are anticipated.

32
33 *Live-fire Training.* Each of these scenarios would equate to an increased number of Soldiers
34 training on O'ahu training ranges. A majority of military traffic would be designated on military
35 roads and trails, therefore military traffic would not interfere with civilian traffic.

36
37 *Maneuver Training.* Long-term adverse effects may occur to each of the O'ahu training areas
38 including South Range, SBER, KTA, KLOA, and DMR. An increase in Soldiers stationed at
39 O'ahu may increase the amount of travel required between the Soldier's home station SBMP
40 and training areas. Soldiers may travel in convoys to be transported to and from training areas.
41 Soldiers are required to follow the guidelines for convoy travel as directed by USAG-HI.
42 Convoys would move in serials, or groups, some as small as 6 vehicles or as large as 24
43 vehicles; and would travel at gaps of 15 to 30 minutes between serials to lessen the impact to
44 on- or off-post traffic. State regulations prohibit convoys to travel on highways during peak
45 commuter hours (Mondays through Fridays between 6:00 and 8:30AM, and 3:00 and 6:00PM).

49 4.2.16 Socioeconomic

50 4.2.16.1 Affected Environment

The ROI associated with the proposed stationing scenarios includes the Counties of Honolulu, located on O'ahu where Schofield Barracks and its designated training areas (South Range, East Range, KTA, and KLOA) reside, and includes Hawai'i (the Island of Hawai'i), where PTA is located (as discussed in Chapter 4.4.14). It should be noted that one county covers each island. Honolulu County covers O'ahu and parts of the smaller islands, and Hawai'i County covers the Island of Hawai'i. Honolulu County is further divided into seven Census County Divisions (CCDs) which are Ewa, Honolulu, Koolauloa, Koolaupoko, Wahiawa, 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..

The population surrounding DMR represented (in the 2000 Census) approximately 1.6 percent of the population of Honolulu County, and by the year 2000, grew to an estimated 14,027 residents. Approximately 69.6 percent of the area (Waialua CCD) is made up of minority ethnic groups, the largest percent of which is Asian/Pacific Islander (37.3 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 2.2 percent of Honolulu County. In the year 2000 nearly 18,900 residents resided in this region. Approximately 68 percent of the population was comprised of minority ethnic groups, the largest percent of which is Asian/Pacific Islander (38.9 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.

According to 2006 data provided by the U.S. Census Bureau the population of the County of Honolulu is estimated at 909,863 and the average household size is approximately 2.93 persons per household. Of the total population, more than 472,000 (age 16 and over) is estimated to contribute to the workforce. The average per capita income is \$27,478 and the median household income is estimated at \$63,372. The unemployment rate in Honolulu County is 3.8 percent, which is below the state average. The total number of housing units on the island is 332,718, of those approximately 125,411 are renter occupied.

According to the Hawai'i Department of Business, Economic Development and Tourism (HDBEDT), the Federal government expenditures in Hawai'i totaled approximately \$9 billion in the year 2000; 39 percent of that was defense expenditures, which were down nearly 54 percent from 1990. The amount of money expended by the Defense Department has increased by 33 percent from 1990 to 2000. By 2002, the defense spending in Hawai'i reached \$3,045 per capita, second only to that of Virginia among the 50 United States. Nonetheless, defense spending in Hawai'i is an economic driver covering goods and services both on- and off-post, and for the off-post housing market.

The school enrollment rates for Honolulu and Hawai'i Counties can be found in Appendix C of this document. Schools near the SBMR and O'ahu training sites are presently operating at or below capacity. The exception is the Mililani High School located on O'ahu, which is presently operating above capacity.

4.2.16.2 Environmental Consequences

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Significant but Mitigable to Less than Significant).

A preliminary socioeconomic analysis of potential effects was conducted for each of the stationing scenarios identified to be suitable for Schofield Barracks and the O'ahu Training Sites. This includes the potential stationing 1,000 or 3,000 Soldiers (as a basis for establishing thresholds) as a result of Army Growth activities. The full analysis can be found in Appendix A of this document. The Economic Impact Forecasting System (EIFS) was used to determine the potential impact that additional Soldiers may have to an area. The EIFS system takes into account the number of affected (moving) civilians and their salaries; number of affected (moving) military employees and their salaries; percentage of affected military employees living on-post; changes in local procurement, contracting, and purchases (economic drivers); and a definition of the multi-county region of influence (ROI). The results of this analysis indicated no major effects to the local economy from an additional 1,000 to 3,000 Soldiers; and indicated beneficial effects to the local housing markets, income, and to the local economy.

Preliminary analysis as cited in Appendix A suggests that the addition of 1,000 Soldiers may add approximately 225 school-aged children to the school system, spread out from grades K-12; and the addition of 3,000 Soldiers may add approximately 745 school-aged children to the school system, spread out from grades K-12. The Army is aware of community and state concerns regarding military impacts to classroom size and school capacity of public schools and would work with the school districts to lessen the impact of additional school-aged children entering the school system. The Army will provide accurate information to the school system as soon as it is available when a decision on Army growth and realignment is made. It is possible that this level of student population growth under some of these stationing scenarios could overcrowd local schools and have an adverse effect to the student-to-teacher ratio.

Cantonment Construction. Beneficial effects are anticipated. For all scenarios, the construction of new facilities at SBMR (potential barracks) and SRAA will have a short-term beneficial effect from an increase in military spending on commercial goods and construction services; therefore resulting in a positive influence to employment and income. A long-term positive effect would result from military and dependent spending on the Island of O'ahu.

Training Range Infrastructure Construction. No additional effects are anticipated. The existing range infrastructure is adequate to meet the needs of any of these stationing scenarios. Therefore, no impacts are anticipated.

Live-fire Training. No impact.

Maneuver Training. No impact.

Combat Aviation Brigade (2,800): (Significant but Mitigable to Less than Significant).

Cantonment Construction. Construction at SBMR, South Range, and WAAF would have a short-term beneficial effect from an increase in military spending on commercial goods and construction services; therefore resulting in a positive influence to employment and income. A long-term positive effect would result from military and dependent spending on the Island of O'ahu.

- 1 *Training Range Infrastructure Construction.* No additional effects are anticipated. The existing
2 range infrastructure is adequate to meet the needs of any of these stationing scenarios.
3 Therefore, no impacts are anticipated.
4
5 *Live-fire Training.* No impact.
6
7 *Maneuver Training.* No impact.

4.3 Fort Shafter, Hawai`i

Fort Shafter Summary

This section provides an overview of the actions the Army would take to implement the Proposed Action under each stationing scenario at Fort Shafter, HI. The Army would undertake only one primary type of action to support new unit stationing at Fort Shafter. This action involves cantonment construction. Although these Soldiers scenarios would involve maneuver training and live-fire training, these actions would be accommodated by a combination of the O`ahu Training Sites and Pohakuloa Training Area. Discussion of impacts from live-fire training and maneuver training are discussed in Chapter 4.2 and 4.4. The discussion of environmental consequences to each resource discusses the impacts of each type of activity and assesses the combined impact of these activities on a given resource. Table 4.3-1 below lists the environmental impacts which are anticipated to occur if the Army were to implement the different unit stationing assignments to Fort Shafter to support growth of the Army needed to support operations in the Pacific Theater. Stationing scenarios possible at Fort Shafter include the stationing of 1,000 additional Combat Support (CS) or Combat Service Support Soldiers (CSS). If the impacts of two scenarios are identical, then discussion of impacts for those scenarios has been consolidated to one section. A summary of the symbology which discusses intensity of anticipated environmental impacts is provided below:

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

1

Table 4.3-1. Fort Shafter VEC Ratings

Fort Shafter, Hawai'i		
VEC	Combat Service Support (1,000 Soldiers)	Combat Support (1,000 Soldiers)
Air Quality	Less than Significant	Less than Significant
Air Space	Minimal	Minimal
Cultural	Less than Significant	Less than Significant
Noise	Minor	Minor
Soil Erosion Effects	Less than Significant	Less than Significant
Biological Resources	Less than Significant	Less than Significant
Wetlands	Minor	Minor
Water Resources	Less than Significant	Less than Significant
Facilities	Significant Adverse	Significant Adverse
Energy Demand/ Generation	Significant but Mitigable	Significant but Mitigable
Land Use Conflict/ Compatibility	Significant Adverse	Significant Adverse
Haz Mat/ Haz Waste	Less than Significant	Less than Significant
Traffic and Transportation	Significant but Mitigable	Significant but Mitigable
Socioeconomics	Less than Significant	Less than Significant

2

3

Fort Shafter Introduction

5

Fort Shafter is located on the south-central coast of O'ahu, and the site of the USARPAC command headquarters and the US Army Engineer Division. The 590-acre installation extends up the interfluve (ridgeline) between Kalihi and Moanalua valleys, as well as onto the coastal plain (as Shafter Flats) at Māpunapuna, and is approximately three miles northwest of downtown Honolulu. Moanalua Freeway is aligned east-west through the installation, dividing it into two areas. North of the freeway is Main Post and south is Shafter Flats. Fort Shafter is also the oldest military base on O'ahu.

13

4.3.1 Fort Shafter Proposed Actions to Support Army Stationing Scenarios

As discussed in Chapter 4.0 (Methodologies) the Army is evaluating several stationing scenarios in USAG-HI that could result in impacts. Due to buildable space constraints, however, the Army is only assessing only two stationing scenarios at Fort Shafter. This involves the stationing of either 1,000 additional combat support or combat service support troops. The administrative functions of these scenarios are similar, and therefore are discussed under the same stationing scenario below. There is not enough buildable space at Fort Shafter to accommodate a larger number of Soldiers and the facilities and storage space they require. A description of activities that would be implemented as part of each scenario is provided below:

Stationing Scenarios: Growth by 1,000 Additional Combat Support or Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Fort Shafter, HI. To accommodate the construction of these facilities the Army would demolish existing or temporary facilities and build on previously disturbed land. Ft. Shafter has existing water, sewer and power to accommodate this level of Army growth.

No training range construction, live-fire exercises, or maneuver exercises would take place at Fort Shafter. Units stationed here would conduct individual weapons qualification and live-fire training on existing ranges at SBMR and at South Range. Discussion in Chapter 4.2 provides details related to the environmental impacts caused by training infrastructure construction, live-fire training and maneuver training activities for these 1,000 Soldier stationing scenarios at training sites on O'ahu. Impacts these Soldier stationing scenarios would have on PTA are provided in Chapter 4.4. Because discussion of the affected environment and environmental consequences from training and training infrastructure construction are provided in other sections for these stationing scenarios, discussion of potential impacts from implementing stationing scenarios at Fort Shafter is limited to cantonment construction. Live-fire and non live-fire exercises and maneuver training would occur as discussed in Chapter 4.2 and 4.4 at SBMR, South Range, SBER, PTA, KTA, and KLOA.

A map illustrating the location of Ft. Shafter on the Island of O'ahu can be found on the next page in Figure 4.3-1.

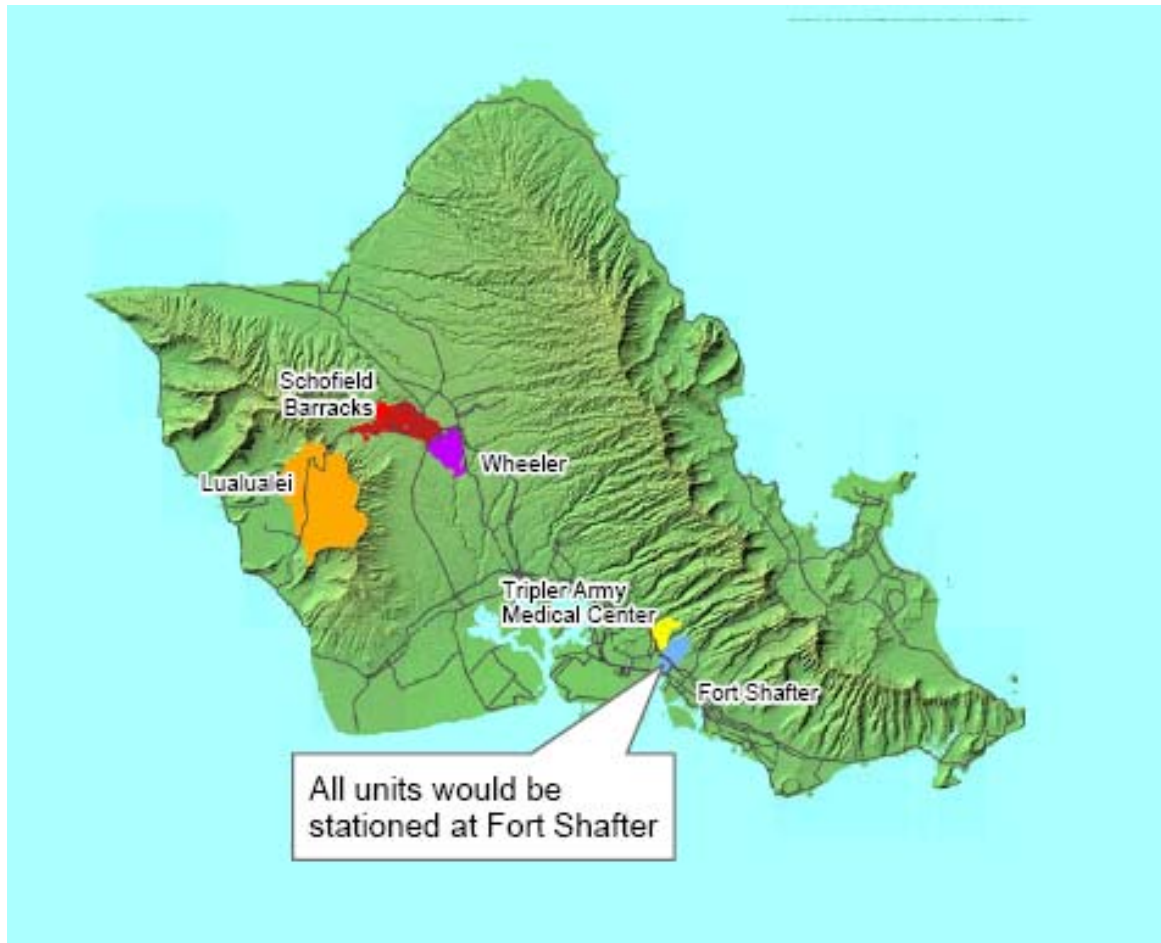


Figure 4.3-1. Map of Fort Shafter (in relation to the Island of O'ahu)

4.3.2 Fort Shafter Affected Environment and Environmental Consequences

This section discusses the existing baseline conditions for each environmental resource as well as the anticipated consequences to Fort Shafter should the Army implement one of the stationing scenarios discussed in Chapter 4.3.1.

4.3.3 Air Quality

4.3.3.1 Affected Environment

Fort Shafter has a very limited annual temperature range can be at a high if 81.4°F in august, down to 72.9°F in January (a difference of only 8.5°F. The average annual precipitation there is approximately 119.58 inches; with the lowest amount of precipitation occurring in June to September, and the highest occurring from October to March (Wai'anae Ecological Characterization Web Site, n.d.)

Major air emissions conditions that influence- and are influenced by Schofield Barracks also can be found at Fort Shafter. Pollution emission levels and ambient air quality concentration are well below federal and state ambient air quality standards. The most significant sources of air pollutants from Fort Shafter are vehicle emissions and fugitive dust. There are no air quality monitoring stations close to the installation and the region is in attainment for all criteria pollutants. Table 4.2-2 lists the state and national ambient air quality standards that are applicable to Hawai'i.

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 particulate matter 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.

4.3.3.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short-term impacts are possible under each of these stationing scenarios. Impacts to air quality 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 which are anticipated to be less than significant. Construction contractors would comply with the provisions of Hawai'i Administrative Rules on fugitive dust (§11-60.1-33) as part of their construction contracts (USAG-HI Teleconference, February 2008). It is expected that these impacts would be less than significant.

Further, in addition to the military vehicles and generators accompanying unit equipment, the added Soldiers and their Families would increase the number of POVs at Fort Shafter. It is also expected that the number of government- and contractor-owned vehicles would increase, thereby increasing the amount of particulate matter, nitrogen oxides, and other emissions

released into the air. Because mobile source emissions would be widely distributed across the ROI It is expected that these impacts would be less than significant.

4.3.4 Airspace

4.3.4.1 Affected Environment

The airspace above O'ahu is generally controlled airspace and is subject to Air Traffic Control. Air Traffic Control airspace is classified with a designation of A, B, C, D, or E. The area around Honolulu International Airport is Class B airspace; while other airports on the island are covered by Class D airspace. Uncontrolled (Class G) airspace exists from the surface to up to either 700 or 1,200 feet above mean sea level (MSL) in few areas over O'ahu. There is no military airspace above Fort Shafter. The installation lies within the terminal control area (TCA) of the Honolulu International Airport, meaning that Fort Shafter is in the vicinity (or in this case the flight path) of one of the airports' runways. A map of the Honolulu International Airport illustrating air traffic direction over Fort Shafter is provided in Figure 4.3-2 below. Fort Shafter is located at the upper northeast quadrant of this map.

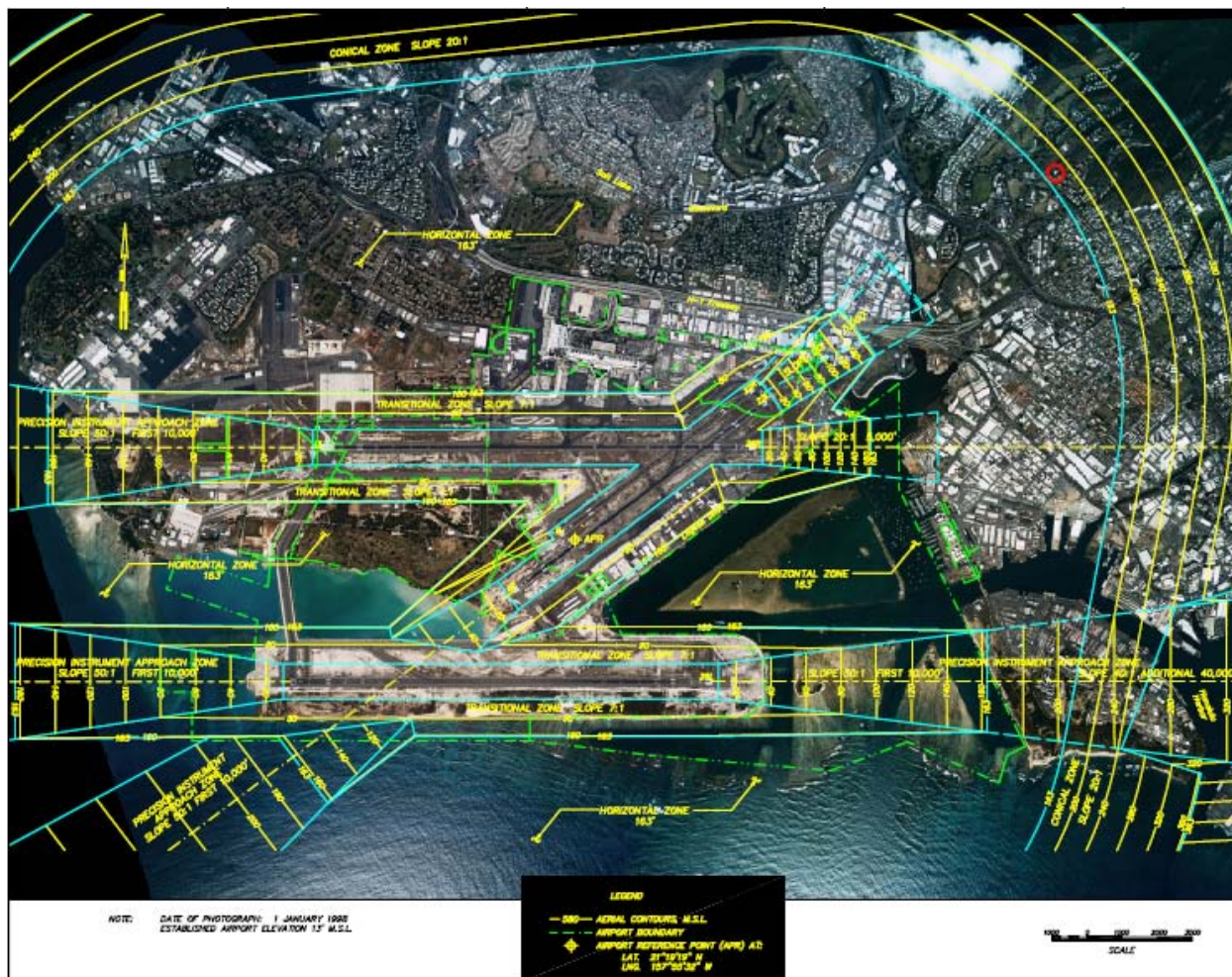


Figure 4.3-2. Map of the Honolulu International Airport illustrating air traffic direction over Fort Shafter

4.3.4.2 Environmental Consequences

CSS (1,000), CS (1,000): (No Impact).

Cantonment Construction. No effects are anticipated. Construction at Fort Shafter is not expected to require modifications to controlled or special use airspace as these units do not require even a moderate amount of airspace. Any construction or alteration of greater height than imaginary surface extending outward and upward at a slope of 1 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport (in this case) an airport available for public use would need to be coordinated with Honolulu Airport and the FAA (FAA Form 7460-1 (2-99) Notice of Proposed Construction of Alteration, §77.13 Construction or alteration requiring notice). Therefore, any construction that may occur at Fort Shafter, within the flight path of Honolulu International Airport, may need to be coordinated with the airport prior to construction.

4.3.5 Cultural Resources

4.3.5.1 Affected Environment

The Hawaiian Islands were settled between AD 100 and 800 from central or east Polynesia, probably first from the Marquesas Islands and possibly later also from the Society Islands. The greatest population expansion in the islands occurred between AD 1150 and 1400, and archaeologists believe that during the later part of this period Hawaiian culture became quite complex. During this time, powerful lineages of high chiefs of O'ahu and Hawai'i were founded. Additionally, agriculture expanded and intensified during this period.

In the 17th and 18th centuries, political strife became common in the islands, as ruling chiefs battled for dominance. By AD 1700, the islands had developed the social structure with well developed population centers, royal temple complexes, and intensive dryland and irrigated agriculture. Political power became increasingly concentrated, culminating in the development of multi-island chiefdoms in the late 1700s. In 1778 Captain James Cook arrived in Hawai'i, the first documented European arrival in the islands (some researchers believe that Spanish galleons may have visited earlier). Cook was killed during his second visit, in 1779, a fact that does not seem to have been a deterrent to foreign visitors. Europeans and Americans soon began to arrive, looking for supplies and trading opportunities. The influx of European and American trade goods, including cannons and other heavy weapons, influenced Hawaiian politics in the end of the 18th century and beginning of the 19th century. The legendary Kamehameha I, who unified and ruled all the Hawaiian Islands, is known to have acquired Western weaponry, which helped him in his conquests. Kamehameha I died in 1819.

Much of Fort Shafter is located in the Kahauiki ahupua'a, which is the second westernmost ahupua'a in Honolulu District and Kona District. Kahauiki has traditional significance and includes special uses such as religious ceremonies and burial. Resources throughout Fort Shafter and Shafter Flats consist of 30 documented archaeological and historical sites and 11 additional unnumbered rockshelters. Additionally, a total of 158 historical and architectural resources have been documented at Fort Shafter and Shafter Flats. USAG-HI completed a historical buildings survey at the installation in 1995 and in 2006. All buildings and other historical structures built before 1951 have been documented and evaluated for significance and

1 integrity, following the criteria of the NRHP and the Army criteria. The Fort Shafter cultural
2 resources management plan summarizes resource eligibility for nomination to the NRHP and
3 presents specific preservation recommendations. Maps illustrating locations of the recorded
4 Historic resources throughout the installation can be found in Figure 4.3-3 (Historic
5 Buildings/Structures and National Register Status) (Final Environmental Assessment for
6 Restructuring of U.S. Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i
7 (Tetra Tech, August 2006).
8
9



Figure 4.3-3. Historic Buildings/Structures and National Register Status

4.3.5.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short- and long-term effects may occur. Dust and vibration from demolition or generated from construction equipment may have direct effects to nearby historic sites. Design and construction plans would need to consider the locations of important cultural and historic resources when siting new facilities. The construction of structures to accommodate growth, depending on their size and location, may cause visual impact to National Historic Landmarks. Any potential impacts that are identified would require USAG-HI to enter into Section 106 consultations. The Army would need to maintain adequate construction buffers around potential affected sites, and may need to ensure a qualified archaeologist or cultural resources specialist monitor all ground modifications prior to and during construction. Any temporary facilities located there would need to be sited away from important resources such that construction or use of heavy equipment would not adversely impact them. Further, any construction would require plans to be consistent with the architectural integrity of the installation and with the developed nature of the area; including any temporary buildings that may be utilized during construction.

4.3.6 Noise

4.3.6.1 Affected Environment

Hawai'i has adopted statewide standards related to construction and fixed noise sources, and impulse and non-impulse noise. These standards are located in Table B-4 of the Environmental Assessment for Transformation of U.S. Army Hawai'i Units to a Modular Force Structure (TetraTech, 2005). Each of these noise levels should not be exceeded by more than 10 percent of the time in a 20-minute period.

There are no activities at Fort Shafter that generate significant noise levels. Ambient noise at the installation is generated from intermittent aircraft flybys from Honolulu International Airport, street traffic, and natural sounds such as heard from wind and birds. Sensitive noise receptors located near the installation include civilian housing and a child development center and playground.

4.3.6.2 Environmental Consequences

CSS (1,000), CS (1,000): (Minor).

Cantonment Construction. Temporary increases in noise generated from construction would be minor. Noise associated with construction equipment will generally produce 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. Given the nearby location of civilian housing and the childhood development center, the Army would have to obtain a noise permit from the Hawai'i Department

of Health. This permit would likely restrict construction activities to daytime hours, reducing any noise impacts to less than significant levels.

Further, the added traffic, largely the use of POVs and additional fleet vehicles, would be consistent with current noise levels.

4.3.7 Soil Erosion

4.3.7.1 Affected Environment

Fort Shafter is underlain by Koʻolau basalts and in some areas by the younger Kalihi basalt member of the Honolulu basalts. Most of Shafter Flats is underlain by artificial fill used to fill two large former fish ponds. The material overlies fine-grained marine sediments and alluvial and coastal deposits. The northeast area of Shafter Flats, however, is underlain by Honouliuli clay.

Soils at Fort Shafter and Shafter flats are characterized as Makiki stony clay loam and Manana silty clay. Makiki soil has moderately rapid permeability and low erosion hazard. The soil has high shear strength and moderate shrink-swell potential. The Manana soil also has high shear strength, but the erosion hazard is moderate to severe. A nonporous panlike sheet up to about one-quarter inch thick occurs at a depth of about 30 to 50 inches.

Earthquake activity in the Hawaiian Islands is centered in the volcanically active southern part of the island of Hawaiʻi. The intensity of ground shaking that may occur at Fort Shafter would depend not only on the magnitude of an earthquake, but also on the nature of the geologic materials at Fort Shafter. Fill soils beneath Shafter Flats are likely to magnify ground motion, and loose sandy soil with a high water table may be susceptible to liquefaction. Liquefaction is a rapid loss of soil strength caused by an increase in pore water pressure during ground shaking. This loss of strength causes the soil to behave as a liquid, which can result in damage to foundations, roads, and other structures. Clay soils are not as susceptible to liquefaction, although all unconsolidated sediments tend to amplify seismic waves to some extent, relative to bedrock. While projected peak accelerations in bedrock are expected to be moderate over most of the upland areas of Fort Shafter where soils are thin, some low-lying areas may undergo more intense ground shaking.

Hazards from earthquakes are relatively low throughout Oʻahu. Past earthquakes have resulted in minor superficial structural damage to some structures, including cracked walls in older buildings. The thin soils that occur on steep slopes within areas mapped as rock land are susceptible to sliding.

4.3.7.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short-term effects may occur. Much of the impacts may be localized to the construction area providing adequate BMPs and mitigations are in place. While much of the construction anticipated may occur on previously disturbed soils, or in the footprint of existing structure (to be demolished), those soils exposed may be denuded of vegetation from digging and excavation, increasing the potential for erosion. Runoff carrying sediments away from the construction sites may directly affect Moanalua Stream and/or Kahauki Stream

1 depending on the siting of construction. The installation may also consider upgrading its storm
2 water pollution prevention plan (SWP3) to minimize soil erosion and loss. The use of a SWP3
3 and BMPs would be anticipated to mitigate any significant impacts to soil erosion and
4 sedimentation.

5
6 Long-term effects may occur as a result of the daily activities of permanently stationed units.
7 Due to the nature of Fort Shafter (largely administrative post with no maneuver or training land)
8 all traffic from the added POVs or fleet vehicles would remain on roads and in parking areas.
9 No added impacts to soils would be anticipated; therefore the long-term effects to soils may be
10 relatively minor.

11 12 13 14 **4.3.8 Biological Resources**

15 **4.3.8.1 Affected Environment**

16
17 Approximately 25% of all listed threatened and endangered species within the United States are
18 located in Hawai'i. Currently, 329 threatened and endangered species are known to exist in
19 Hawai'i. Of these, over 75 are recorded onsite at USAG-HI properties, and designated critical
20 habitat also occurs on three Army sites. A map of O'ahu illustrating critical habitat areas can be
21 found in the biological resources section for Schofield Barracks, Figure 4.2-4 (Elepaio & Critical
22 Habitat on O'ahu).

23
24 The majority of the listed species are plants. Many of the plant species are severely threatened
25 by habitat degradation and loss resulting from invasive species (i.e., invasive/exotic plants, feral
26 hogs, feral sheep, and feral goats) and wildfire. The population numbers of some species are
27 very low and require significant effort to control the threats and stabilize them. USAG-HI has
28 implemented aggressive conservation and management efforts to stabilize and enhance
29 populations of listed plants and animals. USAG-HI participates in seed banking programs in
30 partnership with state and federal conservation programs.

31
32 The Hawaiian Orangeblack Damselfly (*Megalagrion xanthomelas*) is only federally-listed
33 candidate species found near Fort Shafter (specifically at Tripler Army Medical Center). No
34 Critical Habitat is associated with this species at the installation (FEA for Restructuring of U.S.
35 Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August
36 2006)). USAG-HI's natural resources program has developed "No Go" area maps for the
37 damselfly and its habitat to minimize impacts to this species. USAG-HI is also working with
38 various agencies to try and reintroduce the damselfly outside of TAMC.

39
40 Disturbance from human activity, noise, habitat fragmentation, introduction and spread of alien
41 and invasive species, and anthropogenic fire are the primary causes of impacts to flora and
42 fauna on Hawai'i. The Army seeks to minimize and offset its detrimental effects on Hawai'i's
43 flora and fauna through conservation and preservation of federally listed plants on lands under
44 its management. The Army's pest management and endangered species management
45 programs overlap and reduce the negative impacts of introduced species on the landscape. As
46 part of their pest management regulations, the Army seeks to control noxious weeds as required
47 by the State of Hawai'i Noxious Weed Rules. The INRMP for O'ahu outlines current and
48 proposed management plans and specific actions for natural resources stewardship of Army
49 lands. The Army uses up to date scientific information, past achievements, and adaptive
50 management when developing the programs outlined within the INRMPs. In addition, to pest
51 and endangered species management, INRMPs address: biodiversity and ecosystem integrity;

watershed management; wildland fire management; and recreation, education and outreach. The number and type of funded programs varies by USAG-HI priority. These and other management initiatives have led to innovative strategies for conservation and sustainable management of Army landholdings. Such management is necessary in Hawai'i to preserve the integrity of the natural surroundings while maintaining a high standard of military excellence (Final Environmental Assessment for Restructuring of U.S. Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August 2006)).

4.3.8.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant to Significant but Mitigable).

Cantonment Construction. Temporary effects may occur. Construction and modernization efforts would be limited to within the confines of Fort Shafter. Direct effects from construction equipment would have a less than significant impact because the proposed site is highly disturbed land and does not provide high quality habitat for plants or animal species or significant forage, nesting, or cover habitat for wildlife species. There is no critical habitat or ecologically sensitive habitat that would be affected. The areas immediately surrounding the construction sites consist of similarly developed lands. Due to development, ongoing human activity, and sparse discontinuous habitat, any plant or wildlife species residing in this area would consist chiefly of tolerant species that have adapted to the human-influenced landscape.

Under these stationing scenarios it is unlikely that Orangeblack Hawaiian Damselfly (*Megalagrion xanthomelas*) habitat would be disturbed. Planning/siting would avoid known Damselfly habitat / populations to the greatest extent possible in order to prevent potential adverse effects that may result in the need to list the species as threatened or endangered in the future. USAG-HI would continue to consult with the US Fish and Wildlife Service regarding any future construction and the status of this species.

4.3.9 Wetlands

4.3.9.1 Affected Environment

According the Army Environmental Database-Environmental Quality (2007) no jurisdictional wetlands or habitats of special interest occur at Fort Shafter. Kahauiki Stream and Manalua Stream are found on or within the vicinity of Fort Shafter.

4.3.9.2 Environmental Consequences

CSS (1,000), CS (1,000): (Minor).

Cantonment Construction. No adverse effects are anticipated. Although small waterbodies exist on Fort Shafter, and may experience some impacts from construction runoff, the installation would ensure mitigation measures are employed to minimize impacts. Surveys would be conducted prior to any construction to delineate any potential wetlands in the vicinity of the construction sites. The Army would attempt to avoid impacts to wetlands through siting and design of its projects at Fort Shafter if they were identified.

4.3.10 Water Resources

4.3.10.1 Affected Environment

Watershed

Water resources in the ROI include the Moanalua watershed, the Moanalua aquifer, and surface waterbodies as the Moanalua Stream and Kahauiki Stream. Fort Shafter is located within the Moanalua watershed. Fort Shafter is specifically considered within the watershed of Kahauiki Stream which is a subunit to the larger watershed. The stream discharges to the Moanalua Canal (north of State Route 92). Figure 4.3-4 depicts a map of the watershed areas on the Island of O'ahu.

Water Supply

Fort Shafter is underlain by the Maonalua aquifer, which in some locations can flow to within 25 feet of the ground surface, but generally flows at a greater depth. At one time the elevation of the confined groundwater there was reported at 28 feet amsl, increase water use from a growing population has resulted in retreat to a greater depth. There are two water supply wells that feed the area. These are located near Kahauiki Stream and draw from a depth of approximately 330 feet below ground surface and 279 feet below ground surface. Water demand has been steadily growing in the region.

Fort Shafter is supplied by two groundwater extraction wells with an estimated pumping capacity of 3.3 MGD and a reported sustainable yield of approximately 18 MGD. Water is pumped to two storage reservoirs located at the western portion of the installation and is fed through a water supply system where it is treated with fluoridates and chlorinates and distributed throughout Fort Shafter, Shafter Flats, and the Nagorski Golf Course. Figure 4.3-5 is a map of the water distribution and collection system at Fort Shafter.

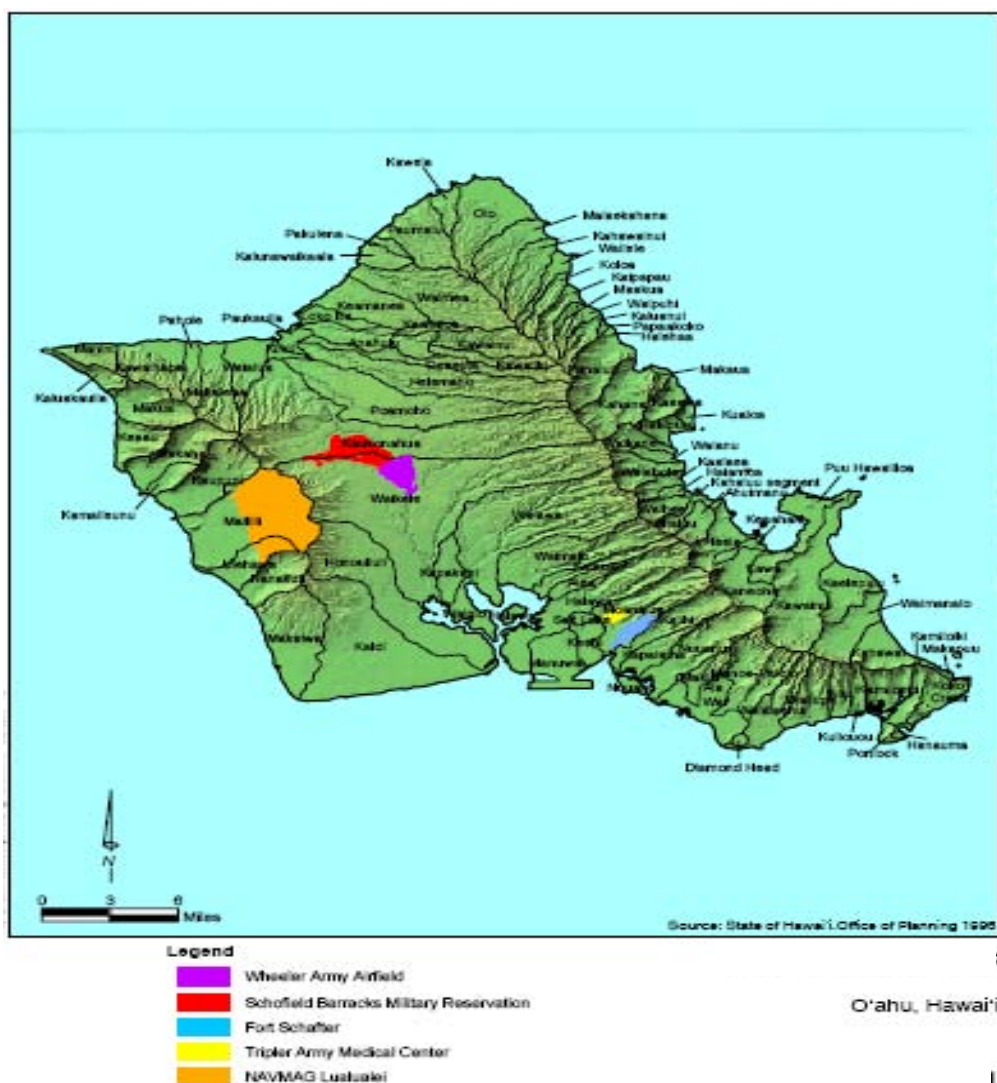


Figure 4.3-4. Watershed units on O'ahu

Wastewater

The Fort Shafter sanitary sewer system has not been studied or analyzed since it was privatized. The Directorate of Public Works indicated the area has no recurring complaints that would imply capacity restrictions. Flow monitoring has not been performed within the Fort Shafter system as it has not been problematic. The Fort Shafter Flats Waste Water Lift Station has been upgraded multiple times throughout its existence. It currently consists of one (1) 2,000 gpm standard use pump, three (3) 2,145 gpm wet weather pumps, and one (1) 3,000 gpm diesel-driven emergency pump with a total design capacity of 9.82 MGD. Average flow is recorded at 1.7 MGD, with the peak recorded flow at 7.7 MGD.

The connection point for the wastewater collection system is at the Fort Shafter Flats Water Lift Station. The pumping station sends the flow through the City and County of Honolulu wastewater system to its Sand Island Treatment Plant (E-mail from USAG-HI Staff, dated 19 February 2008). A map of the wastewater collection system (including the water distribution system) is included as Figure 4.3-5 above.

Stormwater

A portion of the south edge of the Fort Shafter is in the drainage area of Kalihi Stream, which discharges to the Ke'ehi Lagoon south of Highway 92. Stormwater and runoff from the installation influences flow of the Kahauki Stream, which can also impair the waterbody by increasing nutrient load and turbidity. The Moanalua Stream is listed by the State as a Class 3 perennial stream and Clean Water Act Section 303(d) impaired waterbody.

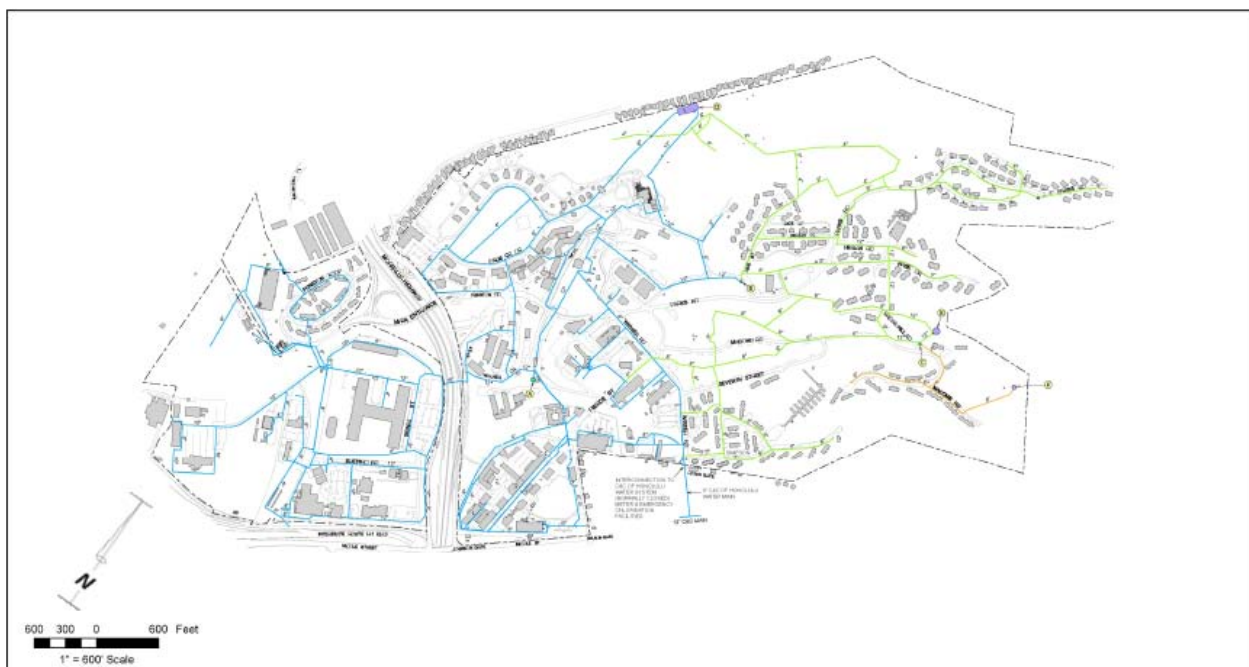


Figure 4.3-5. Map of Fort Shafter's water distribution and collection system

4.3.10.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. The increase in Soldiers (excluding Families) is projected to increase wastewater flow by approximately 40,000 GPD. The existing wastewater collection system may not have the capacity for the additional flow, an issue that may result in spills. If either stationing scenario were to be implemented at Fort Shafter, further modeling would determine capacity and steps may need to be taken to minimize potential flow issues (E-mail from USAG-HI Staff, dated 19 February 2008). The addition of 1,000 Soldiers would draw more water from

the underlying aquifer; however, this level of growth would not place any considerable demand on the water supply and therefore is anticipated to have only less than significant effects.

Construction and facility modification to support either of these stationing scenarios would likely be spread throughout the installation. Demolition and new construction would result in ground disturbance that may increase the potential for soil erosion and for sediments to be washed overland into the nearby Moanalua Stream at Fort Shafter. Construction site discharges not related to storms are prohibited under the Clean Water Act. Because the construction would involve disturbance of more than one acre of land, the Army would update the installation stormwater pollution prevention plan to incorporate these new site parameters, including BMPs, to minimize potential impacts associated with increased runoff. Implementation of the BMPs would reduce the potential for erosion impacts to less than significant levels and would ensure less than significant adverse impacts on receiving waters at Fort Shafter.

Furthermore, because of Moanalua Stream's listing as a Class 3 perennial stream, an impaired water body, it is assumed that the restructuring and stationing activities and associated construction would be planned to prevent further degradation of the streams. The installation would implement BMPs at locations where motorpool or other activities could have impacts to water quality from spills of petroleum, oil, or lubricants.

4.3.11 Facilities

4.3.11.1 Affected Environment

Facilities

The installation consists of 590 acres in the Kahauiki Valley positioned approximately three miles northwest of Honolulu. The Moanalua Freeway divides the installation in two, running east to west; the north side of the freeway is considered the main post, the south is Shafter Flats. The installation has principally administrative, residential, and community support facilities. Shafter Flats supports industrial, maintenance, classroom and parking, and provides Family housing.

Currently there is a shortfall in facilities to accommodate the installations' present force structure. Construction is needed to meet standard facilities requirements to fulfill Army Transformation and Modularity obligations³.

Public Services

In most instances, emergency fire and medical services are provided by the U.S. Naval Station Pearl Harbor, and is augmented by the Honolulu Fire Department. Medical services are provided to all Soldiers and their Families from Tripler Army Medical Center. Military Police are provided through the Provost Marshall's Office.

Infrastructure

³ Construction identified to accommodate Transformation decisions is outlined in the Final Environmental Assessment for Restructuring of US Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August 2006).

Water demand has been steadily growing in the region. Fort Shafter is supplied by two groundwater extraction wells with an estimated pumping capacity of 3.3 MGD and a reported sustainable yield of approximately 18 MGD. Water is pumped to two storage reservoirs located at the western portion of the installation and is fed through a water supply system where it is treated with fluoridates and chlorinates and distributed throughout Fort Shafter, Shafter Flats, and the Nagorski Golf Course.

4.3.11.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant Adverse).

Cantonment Construction. The installation does not currently have adequate vacant space to support this level of growth without deconstructing/demolishing existing aging facilities. Temporary modular structures may need to be used to meet the requirements of units until construction is complete. Any temporary facilities located there would need to be sited away from documented and suspected sites such that construction or use of heavy equipment would not result in adverse impacts. Further, any construction would require plans to be consistent with the architectural continuity of the installation and with the developed nature of the area; including any temporary buildings that may be utilized during construction.

Due to the location's proximity to surface waterbodies, the installation would need to develop flood control measures to ensure surface water is not significantly impacted and further degraded. The increased demand on the water supply and distribution would continue to be adequate (and still maintain reserve capacity). Upgrades to existing infrastructure would be required and would drive up the cost of construction.

4.3.12 Energy Demand/Generation

4.3.12.1 Affected Environment

HELCO provides two 46 kV (kilovolt) transmission lines to Fort Shafter. Each line has a separate transformer feeding the Fort Shafter distribution system. One line feeds a 10 MVA (megavolt ampere) 46 kV-12.47/7.4 kV transformer, and the other line feeds a 5/6.25 MVA, 46 kV-12.47/7.4 kV transformer.

The main overhead lines use 2/0 CU (copper) conductor, which has a normal continuous line rating of 360 amps (amperes) (4.49 MVA at 12.47 kV) and an emergency rating of 500 amps (6.24 MVA at 12.47 kV). The main underground cables use a 500 MCM (multichip module) CU conductor, with a rating of 500 amps. In a 2006 electrical infrastructure study, Electrical Power Systems personnel evaluated the case of all feeders in service at Fort Shafter and for several single feeder outages. Based on the power flow results of the evaluated case, there are no voltage violations or line overloads for outages within the 12.47 kV distribution systems. An outage of either substation transformer does create an unacceptable response. After the loss of the 10 MVA substation transformer, there is not sufficient capacity on the 6.5 MVA transformer to serve all of the Fort Shafter loads during peak loading conditions.

4.3.12.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant but Mitigable).

Cantonment Construction. Power distribution servicing Fort Shafter and is inadequate and would likely need to undergo significant upgrades to accommodate this level of Soldier growth. Stationing of an additional 1,000 Soldiers associated with Combat Support and Combat Service Support units would essentially double the impact identified in the 2006 FEA for Restructuring of US Army Pacific Elements to a Modular Force Structure, essentially requiring the installation to recommended improvements (discussed above), enabling increased distribution capacity and minimizing any adverse effects that may occur from a loss of service from the current primary power infrastructure.

4.3.13 Land Use Conflict/Compatibility**4.3.13.1 Affected Environment**

The land uses on Fort Shafter's main post are predominantly administrative, residential, and community support. Barracks facilities are centrally located along Bonnie Loop, and family housing is located in the upper areas of the Main Post. Within Shafter Flats, land uses are generally industrial, maintenance, educational, and parking; this area also includes a family housing area, Funston Family Housing, in the northwestern portion. The Fort Shafter 2002 Land Use Plan is shown on Figure 4.3-6 (Final Environmental Assessment for Restructuring of U.S. Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August 2006)). Potential land uses associated with the proposed action at Fort Shafter include administrative, vehicle storage and maintenance (motor pool), and housing (unaccompanied personnel and Family housing). The administrative requirement of the proposed action could be met, in part, by consolidating administrative uses within existing administration buildings.

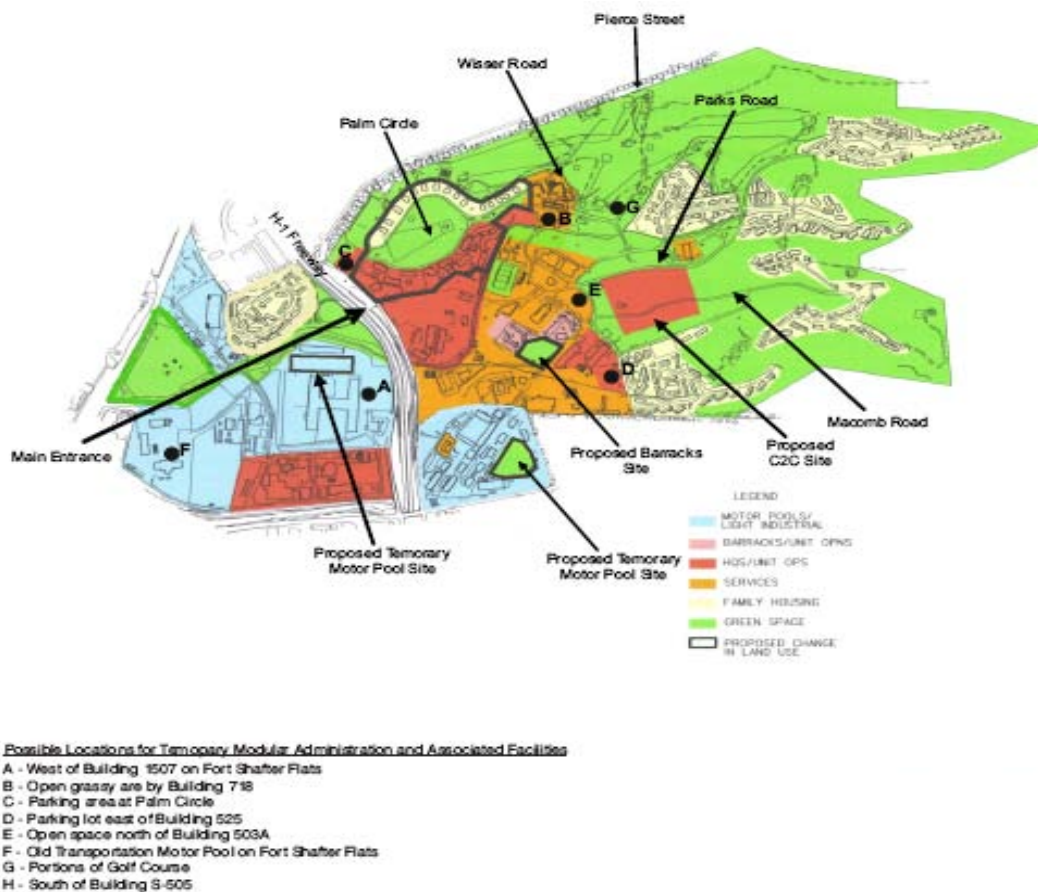


Figure 4.3-6. Fort Shafter Land Use Plan

4.3.13.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant Adverse).

Cantonment Construction. Short-term effects would occur. Housing on the installation is at or near capacity. The land available for construction outside the main post is primarily mountainous with little topographic relief, which poses a challenge to construction planning. Other parcels of land that is available for construction is located within the main post at Shafter Flats. In addition to the need for demolition of existing structures at Shafter Flats, that location would require construction of a flood control structure because this portion of the installation is subject to tsunami run-up and driving an increase in construction costs.

Fort Shafter would employ the use of modular facilities in locations that may be in close proximity to cultural or historic resources, and further, would not be compatible with the current

land uses in those areas. During construction there may be the potential for damage to occur to historic structures on the installation. The installation would avoid damage to cultural resources to the extent possible.

4.3.14 Hazardous Material/Hazardous Waste

4.3.14.1 Affected Environment

Hazardous waste at the USAG-HI is tracked and grouped into the following categories lumped by how they are generated: Ammunition, Live-fire, and UXO; Petroleum, Oils, Lubricants (POL), and Storage Tanks; Contaminated and Installation Restoration Program (IRP) sites; Lead; Asbestos; PCBs; Pesticides and Herbicides; Radon; and Hazardous Wastes.

Ammunition, Live-fire, and UXO: Fort Shafter has no live-fire ranges, impact areas, ammunition storage, or surface danger zones; and the Soldiers that are stationed there are transported elsewhere within the Garrison to conduct training activities.

Petroleum, Oils, Lubricants (POL), and Storage Tanks and IRP Sites: Facilities containing oil-water separators, grease traps, and wash racks are inspected regularly by the USAG-HI Environmental Compliance Office, and DPW is responsible for maintaining these devices. Investigations as part of the sub-installation assessment program were conducted of the area in 1983 and 1984. Site investigations revealed no significant sources of contamination at that time. Follow-up investigations in 1990 through 1994 revealed the need for underground storage tank (UST) removal, which was completed in 1994; however, due to contamination identified after excavation of one UST, remedial efforts are still ongoing. An additional five sites were identified in 1992 and recommended for further investigations. More information can be found in the Final Environmental Assessment for Restructuring of U.S. Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August 2006).

Lead: The results of lead surveys at USAG-HI are available through the Garrison's Department of Public Works. Lead was a major constituent of household paint throughout the country on both interiors and exteriors of houses and other structures. Since the ban of its use in 1978, lead management practices have been established throughout the Army. The USAG-HI has established an installation lead hazard management program to ensure the health and safety of Soldiers and civilians throughout the garrison. Army policy, like USEPA policy, is to manage LBP in place unless it presents an imminent health threat, as determined by the installation medical officer, or unless operational, economic, or regulatory requirements dictate its removal. Army policy also imposes requirements to reduce the release of lead, lead dust, or LBP into the environment from deteriorating paint surfaces, building maintenance, or other sources on Army installations or on Army-controlled property. Lead is also present in military munitions and bullets. Since Fort Shafter has no live-fire facilities lead contamination from training is not present there.

Asbestos: The USEPA and the Occupational Safety and Health Administration regulate asbestos-containing material (ACM) removal and cleanup and the State of Hawai'i Department of Health administrative rules apply. The Toxic Substances Control Act, the Asbestos Hazardous Emergency Response Act, and OSHA regulations provide protection for employees who encounter or remove and clean up ACM. The NESHAP regulates the renovation, demolition, and disposal of ACM. Asbestos is managed uniformly across the installations in the ROI. An installation asbestos management program has been established by the Army Directorate of Public Works to ensure the health and safety of Soldiers and civilians. All

buildings constructed prior to 1980 are suspected risks for asbestos, and upon identification of renovation or demolition projects these buildings are surveyed for asbestos-containing material. ACM can be found, for example, in the floor tiles of housing units.

PCBs: PCBs are found in cooling fluid of electrical equipment, fire retardants, and other solid materials. The USAG-HI has a proactive program for removing and retrofitting electrical equipment containing regulated amounts of dielectric fluid containing PCBs. Devices that are found to contain regulated levels of PCB are being removed and upgraded with non-PCB devices, or are being retrofitted or removed, drained, packaged, and disposed of in accordance with 40 CFR Part 761.

Pesticides and Herbicides: Various types of pesticides, including insecticides, herbicides, fungicides, avicides (bird poison), and rodenticides, have been used at Army properties to maintain the grounds and structures and to prevent pest-related health problems. These materials are commonly used throughout the Army at USAG-HI installations to prevent and mitigate pest-related health problems and maintain grounds and structures. These chemicals are stored at controlled locations that are convenient to their intended use and that are equipped with ventilation and secondary containment and do not contain floor drains. Typically an entomologist oversees the pest management program at larger installations, maintains pesticide inventories, approves pesticide application procedures, and reviews pesticide use documents. Pesticides were applied in and around housing and buildings on Fort Shafter in the past. Buildings to be renovated may include pesticides in the support beams and other buildings features. Pesticides may further be present in the soils where housing previously stood. Testing would be required and proper abatement employed.

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 EPA's recommended action level of 4 picocuries per liter, and thus there is not much concern at this location.

Hazardous Wastes: Motorpools may also be designated as waste storage and holding areas, with primary and secondary containment for wastes generated by vehicle servicing and shop areas. Wastes are temporarily collected and stored in areas of the motorpools with secondary containment and separated out. Disposal of such waste is accomplished in accordance with AR 200-1.

4.3.14.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short-term and long-term less than significant effects would occur.

POLs. The temporary motor pools proposed for Fort Shafter and Fort Shafter Flats would likely result in small amounts of gasoline, oil, and other automobile fluids being spilled onto the ground. Given the temporary nature of these motor pools, the normal amount of spilled petroleum and other fluids to be expected with such use would likely be absorbed by the base course, the geotechnical fabric, and the sub-base which would be included in standard design plans. These protective features may likely be installed on top of the native soil at Fort Shafter; and existing pavement at Shafter Flats would serve as a barrier for much of the expected fluid

spills at that location. Operations at these facilities would follow best management practices and USEPA and USAG-HI protocol for use and handling of hazardous materials, such as POLs. The Army DPW maintains a spill contingency plan and standard operating procedures that outline proper operating and emergency response procedures and responsibilities. Additionally, the Army conducts routine inspections of all facilities containing hazardous materials to ensure compliance. Therefore, the effects from an increase in POLs at modular facilities are likely to result in less than significant impacts at Fort Shafter.

Long-term effects would occur from activities such as from motorpools and the medical center, which are associated with the permanent stationing of units at the installation. The Army has an installation-wide program for hazardous waste management and disposal. The installation would be required to manage and dispose of hazardous waste generated by operations through DRMO in accordance with regulations and installation-wide protocol regarding storage, use, and disposal. Therefore, the proposed action would have a less than significant impact on hazardous waste management.

The installation may experience substantial POL storage, use, and handling demands. The POVs of the new Soldiers and Family members would use the on-post facilities for fueling and maintenance. These facilities are designed to withstand the increased POL needs without requiring the installation of new tanks or fueling stations. The existing underground storage tanks would be refueled as needed to support the increased population needs.

A historical use may need to be performed to determine if additional cleanup will need to occur.

Lead/Asbestos. There could be exposure to lead and asbestos through old construction materials (during demolitions). Abatement procedures would be employed to identify LBP and friable ACM and to contain the material during renovation activities. All construction personnel would be notified of the possibilities of these materials and would be trained in how to properly handle and dispose of it without exposure to themselves or the surrounding environment. By employing these management practices, no significant impact is anticipated. New facilities would not contain asbestos or lead-based paint. The Army would continue to inform Soldiers about lead and asbestos in housing units and to survey for lead and asbestos.

IRP. There would be no change in the management of IRP sites. Any hazardous waste found during any phase of construction would be remediated in accordance with applicable local, state, and federal rules and regulations. These sites would continue to be monitored and managed, and no impacts are anticipated.

Herbicides and Pesticides. This increased use around new facilities would not affect the way pesticides and herbicides are managed at the installation and would result in a less than significant impact. Pesticides may remain in the soils from past usage. Appropriate consideration, testing, and abatement measures should be completed prior to and during excavation of known sites.

4.3.15 Traffic and Transportation

4.3.15.1 Affected Environment

Traffic and circulation refer to the movement of vehicles and pedestrians along and adjacent to roads. Freeways and major roads are under the jurisdiction of the state through the Hawai'i

Department of Transportation (HDOT). Other public streets and roads are under the jurisdiction of the counties, and streets and roads within the installations are under the jurisdiction of the military. Roadway types range from paved multi-lane road networks to unpaved plantation roads. Traffic conditions in Hawai'i vary depending on location but are typically over capacity during peak hours, resulting in significant traffic delays. These traffic delays occur in urban areas with multi-lane roads as well as in less developed areas with only two-lane roads. This section defines traffic terms, describes the regional transportation agencies in the ROI, and provides an overview of adopted transportation goals and policies that guide transportation development in the ROI. The ROI for each component of the proposed action is as follows:

Fort Shafter: The ROI for Fort Shafter includes the installation and its perimeters and the roadways found adjacent to the installation; construction areas; Buckner and Patch gates, which are the points of entry and exit at Fort Shafter; and areas adjacent to the installation that an influx of 1,000 Soldiers and their Families may potentially influence. Roadways adjacent to the installation include Moanalua Freeway, Kaua Street, Notley Street, and Meyers Street.

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 H-201, H-1, H-2, and H-3. State Road 78 (aka 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 SBMR 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. Figure 4.3-7 illustrates the important intersections and roadways on Fort Shafter. Figure 4.3-8 illustrates important roadways surrounding Fort Shafter. These were provided within the Final Environmental Assessment for Restructuring of U.S. Army Pacific Elements to a Modular Force Structure, O'ahu, Hawai'i (Tetra Tech, August 2006).

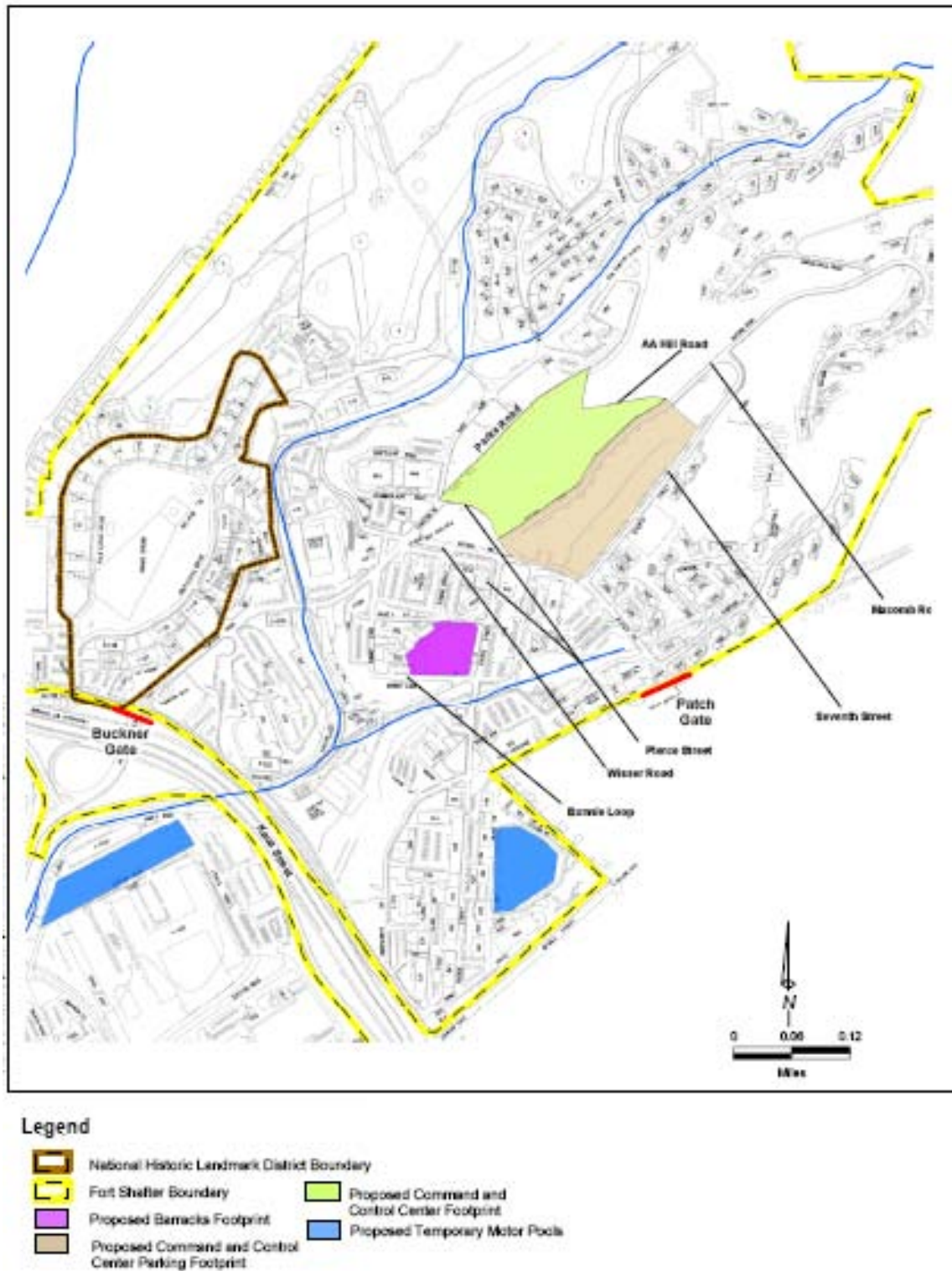


Figure 4.3-7. Important intersections and roadways on Fort Shafter

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4.3.15.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant but Mitigable).

Cantonment Construction. Short- and long-term effects would occur.

Short-term effects from construction. Construction would likely result in the redirection of- and increase in traffic within the affected area. These traffic pattern changes may only take place within the installation and at the main gate entering the installation. It was indicated by garrison staff (February 2008) that traffic is already experiencing some degree of congestion on the Moanalua Freeway (H-201) dividing Fort Shafter from Shafter Flats.

Currently, the guards keep traffic flowing at an acceptable rate through Buckner gate (the main gate); the addition of 1,000 Soldiers and family members may considerably increase flow, resulting in further congestion and back-ups. The number of parking spaces required to accommodate these scenarios would be substantial. Assuming that each Soldier may operate a POV, as would a percentage of family members; there may be an increase of 1,200 to 1,500 POVs operating on the installation.

Within Fort Shafter, the potential impact on base intersections is expected to be significant, and may require mitigations to minimize adverse effects. Long-term effects may include increased congestion at the Funston Road/Wisser Road intersection; however the intersection would be still functional. There could be an increase in traffic delays at this intersection. There may also be a possibility for light congestion at the Pierce Street and Wisser Road intersection, with occasional backups with average traffic delays. Speed limits and traffic signals are enforced by the MP, and traffic entering and leaving post are monitored by Soldiers or Department of Defense officers at each gate.

It is expected that flow on the freeway would worsen, possibly requiring additional traffic studies. The Army currently operates a public Web site (<http://www.25idl.army.mil>) that lists a schedule of upcoming USAG-HI activities.

The effects from convoys would be short-term as these activities are intermittent and are usually mitigated through standard operating procedures 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, ten or more vehicles per hour going to the same destination over the same route, or any one 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 AM and 8:30 AM and 3:00 PM and 6:00 PM, Monday through Friday). Movements on Saturday, Sunday, and holidays are by special request only.

4.3.16 Socioeconomic

4.3.16.1 Affected Environment

The ROI associated with stationing Soldiers at Fort Shafter would include only the region where Fort Shafter resides, and the designated training areas that Soldiers may use for live-fire or

maneuver exercises. Depending on the type(s) of units that may potentially be stationed at the installation, these training areas could include KTA, KLOA, the South Range Acquisition Area, or East Range.

Fort Shafter and these training areas are located within the county of Honolulu (on the Island of O'ahu). As discussed in Chapter 4.1.14.1 (Socioeconomics for stationing scenarios affecting Schofield Barracks), Honolulu County is divided into seven CCDs. These are Ewa, Honolulu, Koolauloa, Koolaupoko, Wahiwa, Waialua, and Waianae; each is a permanent statistical area established cooperatively by the state and local governments with the U.S. Census Bureau. There are twelve (12) districts within Hawai'i County; these are Hilo, Honokaa-Kukuihaele, Kau, Keaau Mountain View, North Hilo, North Kohala, South Kohala, North Kona, South Kona, Paauhau-Paauilo, Paho-Kalapana, and Papaikou-Wailea.

According to 2006 data provided by the U.S. Census Bureau the population of the County of Honolulu is estimated at 909,863 and the average household size is approximately 2.93 persons per household. Of the total population, more than 472,000 (age 16 and over) is estimated to contribute to the workforce. The average per capita income is \$27,478 and the median household income is estimated at \$63,372. The unemployment rate in Honolulu County is 3.8 percent, which is below the state average. The total number of housing units on the island is 332,718, of those approximately 125,411 are renter occupied.

School enrollment rates can be found in Appendix C of this document. Schools in the vicinity of Fort Shafter are presently operating at or below capacity. The exception is the Mililani High School located on O'ahu which is presently operating above capacity.

4.3.16.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Construction of new facilities at Fort Shafter may have both short-term adverse and beneficial effects.

Construction would be temporary, but would directly affect on-post activities through noise and dust; and directly and indirectly affect off-post traffic and the flow of commuter traffic heading on-post. Local schools or daycare facilities may be indirectly affected due to a temporary increase in traffic flow or noise. Construction may also have a beneficial effect to the local commercial construction contractor market from an increase in military spending on commercial construction services. These effects would be less than significant.

Housing would be provided in available units at Fort Shafter and other O'ahu military housing, or would otherwise be obtained off-post. Off-post housing would be affected by the new personnel. Hawai'i rental rates are among the highest in the nation, and available rental housing has been decreasing in the past five years.

The stationing of additional Soldiers would have beneficial effects on the local economy, with minor increases in employment, income, and business sales volume indirectly due to expenditures that would stimulate the local economy. These beneficial impacts would be less than significant because the changes to these factors would be within the capacity of society and the economy to absorb.

1 Long-term adverse effects may occur due to an increase in enrollment in local schools.
2 Appendix A indicates through preliminary EIFS analysis that the addition of 1,000 Soldiers may
3 add approximately 225 school-aged children to the school system, spread out from grades K-
4 12. Installation staff conveyed that the State of Hawai'i has expressed concerns with the
5 current capacity of public schools. The addition of new students could potentially off-set the
6 current balance of students-to-teachers. Although the Army is working to minimize impacts on
7 the schools now and in the future, they do not control factors such as placement of students or
8 teachers in specific schools, construction of classrooms, and allocation of federal impact aid
9 funding. As such, these impacts could place significant demands on already overburdened
10 schools.
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4.4 Pohakuloa Training Area

Pohakuloa Training Area Summary

This section provides an overview of the actions the Army would take to implement the Proposed Action under each stationing scenario at Schofield Barracks or Fort Shafter. Pohakuloa Training Area (PTA), under either scenario, would continue to accommodate Soldier training activities. The Army would undertake three primary types of actions at PTA in support of new unit stationing on O'ahu. These actions include training range infrastructure construction, live fire training, and maneuver training activities. The discussion of environmental consequences to each resource discusses the impacts of each type of activity and assesses the combined impact of these activities on a given resource. Table 4.4-1 below lists the environmental impacts which are anticipated to occur if the Army were to implement various different unit stationing assignments to O'ahu, supported by training at PTA to support operations in the Pacific Theater. Stationing scenarios addressed include 1,000 additional Combat Support (CS) or Combat Service Support Soldiers (CSS), 3,000 additional CS or CSS Soldiers, or a new Combat Aviation Brigade. A summary of the symbology which discusses intensity of anticipated environmental impacts is provided below:

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

Table 4.4-1. Pohakuloa Training Area VEC Ratings

Pohakuloa Training Area, Hawai`i					
VEC	Combat Service Support (1,000 Soldiers)	Combat Support (1,000 Soldiers)	Combat Aviation Brigade (2,800 Soldiers)	Combat Service Support (3,000 Soldiers)	Combat Support (3,000 Soldiers)
Air Quality	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Air Space	Minor	Minor	Less than Significant	Minor	Minor
Cultural Resources	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Noise	Less than Significant	Less than Significant	Significant but Mitigable	Less than Significant	Less than Significant
Soil Erosion Effects	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Biological Resources	Less than Significant	Significant but Mitigable	Significant Adverse	Significant but Mitigable	Significant but Mitigable
Wetlands	Minor	Minor	Minor	Minor	Minor
Water Resources	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Facilities	Minor	Minor	Minor	Minor	Minor
Energy Demand/ Generation	Minor	Minor	Minor	Minor	Minor
Land Use Conflict/ Compatibility	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Haz Mat/ Haz Waste	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Traffic and Transportation	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Socioeconomics	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant

PTA Introduction

Located on the island of Hawai`i, PTA (Figure 4.4-1 below) is the largest Army training area in Hawai`i, totaling 132,784 acres. PTA lands are within the state-designated Conservation District General, Limited, and Resource Subzones (State of Hawai`i 2002a). Land uses at PTA include the cantonment area, BAAF, maneuver training areas, drop zones, live-fire training ranges, artillery firing points, an ordnance impact area, and areas unsuitable for maneuver. The cantonment area consists of 566 acres with 154 buildings, mostly Quonset huts (USARHAW and 25th ID [L] 2006). BAAF has a 3,969-foot runway and offers helicopter access and limited C-130 access (USARHAW and 25th ID [L] 2006). Land suitable for field maneuvers consists of approximately 56,661 acres, and the ordnance impact area is approximately 51,000 acres (USARHAW and 25th ID [L] 2006). Recreation at PTA includes archery, biking, motor sports,

1 and hunting on designated training areas, which the Army coordinates with the state (R.M.
2 Towill Corp. 1997a). Lands surrounding PTA are generally within the state-designated
3 Conservation District (USARHAW and 25th ID [L] 2006). Land uses in the areas include cattle
4 grazing, game management, forest reserves, and undeveloped land. Land to the northwest of
5 PTA is agricultural, primarily for cattle grazing, and also provides limited hunting opportunities
6 for big game species and game birds. Land to the north of PTA includes the Kaohe Game
7 Management Area, Mauna Kea State Park, Mauna Kea Forest Reserve, and the Mauna Kea
8 National Natural Landmark. Land to the east and south is included in the Mauna Loa Forest
9 Reserve. The Mauna Kea Forest Reserve is also critical habitat for the Palila.

10
11 The Keamuku Parcel was acquired in July 2006. It lies at the western foot of Mauna Kea and
12 consists of approximately 23,000 acres. West PTA will be used primarily as a nonlive-fire
13 maneuver training area. Other uses may include continued cattle grazing and/or quarry
14 operations. This area was previously leased four to six times a year by the Army or other
15 military entities for maneuver training (USARHAW and 25th ID [L] 2006). The Mamalahoa
16 Highway forms the northwestern boundary, and Saddle Road forms most of the eastern
17 boundary. Saddle Road Junction, where these roads connect, forms the northern boundary.
18 Land uses surrounding the Keamuku Parcel include cattle grazing, military training, agriculture,
19 residential lots, and open space. PTA is to the south-southeast of the area, and the Puu Paa
20 Military Maneuver Area is adjacent to the northern tip, west of Mamalahoa Highway. The
21 remaining surrounding lands are used for recreation and ranching or are undeveloped.

22
23 As a military training site, PTA provides the Army with a unique location in the Pacific Theater
24 which allows the Army to execute large scale combined arms maneuver training tasks. PTA
25 supports all types of live-fire training and is capable of supporting maneuver at the battalion and
26 brigade levels. A number of collective and small arms ranges are currently sited on PTA and
27 weapons systems fired at PTA include small arms, antitank weapons, mortars, field artillery, air
28 defense artillery, machine guns, demolitions and rockets. PTA supports the training of not just
29 Army units, but also U.S. Navy, Marines, Air Force, Special Operations Forces and allied armed
30 forces from around the Pacific Region.

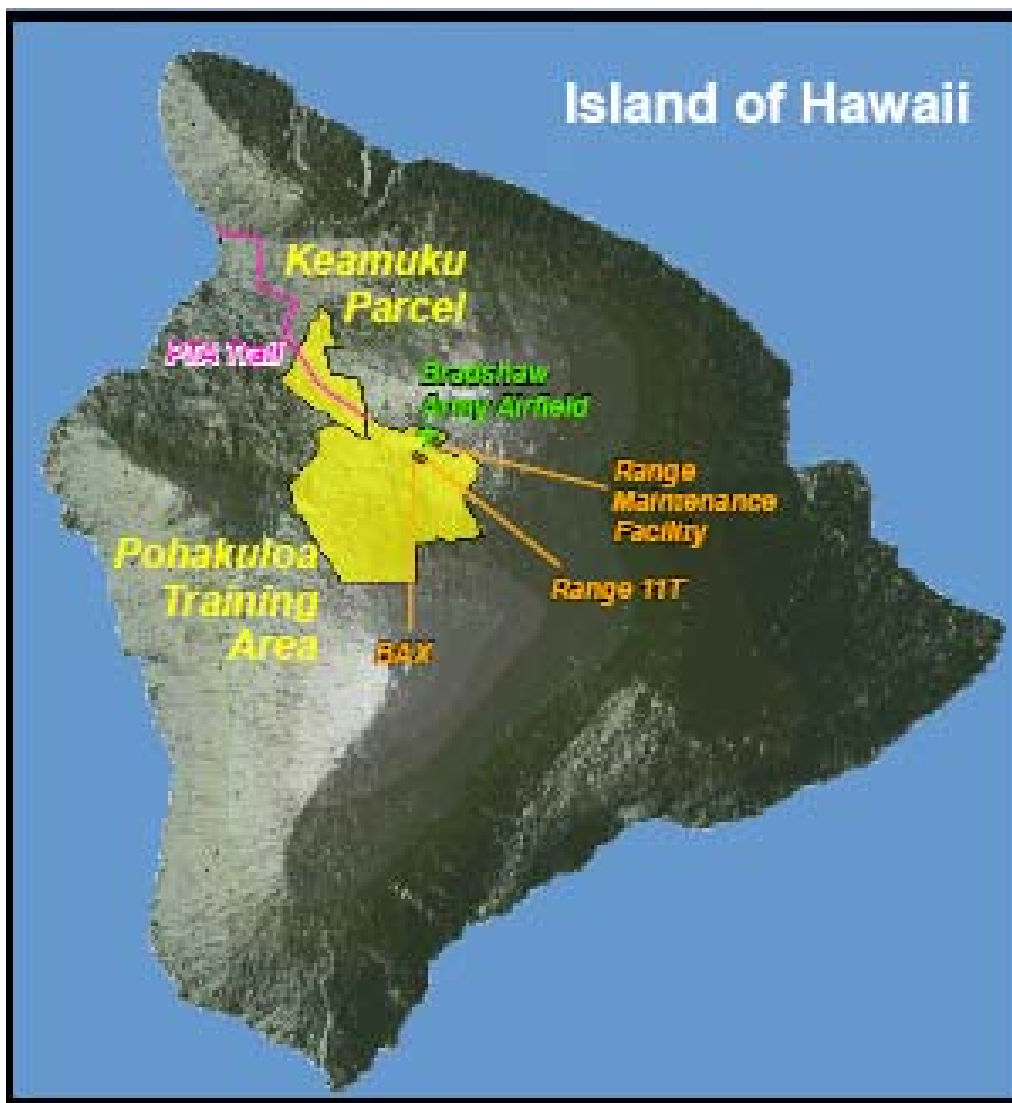


Figure 4.4-1. Pohakuloa Training Area

4.4.1 PTA Proposed Actions to Support Army Stationing Scenarios

As discussed above, the Army is evaluating several stationing scenarios in USAG-HI that could result in impacts. PTA will support training activities under all unit stationing scenarios at SBMR and Ft. Shafter. The Army is not proposing to build any additional cantonment facilities at PTA under any of the stationing scenarios analyzed in this document. Units stationed at part of growth and realignment would conduct garrison operations and administrative functions at SBMR or South Range. Additional range construction activities would occur in association with stationing an aviation brigade, where the current aviation gunnery range (Range 20) located in the impact area of PTA would be upgraded and expanded. Impacts to road and trail infrastructure would occur under all scenarios. Live-fire activities on larger ranges would be

associated with CS but not CSS stationing scenarios. Potential impacts from live-fire training at PTA would be most intensive if an aviation brigade were stationed in Hawai'i when compared to the other proposed stationing scenarios. A description of activities that would be implemented as part of each scenario is provided below:

Scenario 1 & 2: Growth by 1,000 Additional Combat Support or Combat Service Support Soldiers

Live Fire and Maneuver Training: Units stationed in Hawai'i under these scenarios would conduct small unit maneuver training (squad, platoon and company) and live-fire qualifications on the Island of O'ahu at USAG-HI training sites. CS and CSS units would deploy to PTA to support large unit maneuver events at the battalion and brigade level. CSS units would participate in limited fashion providing logistical support and other functions to combat units as they conducted live-fire training exercises. During maneuver rotations, CSS unit support would involve primarily hauling and logistical support to resupply BCT and CS units during maneuver training rotations. In accordance with current SOPs, all maneuver activities at PTA would occur on existing roads and trail networks.

CS units would conduct a higher percentage of off-road maneuvers and would support BCTs during integrated maneuver training events. Under both CS and CSS stationing scenarios discussed, the number or frequency of maneuver rotations at PTA would not be anticipated to change, though more vehicles may participate in maneuver training events to ensure all units maintain optimal training readiness. Both stationing scenarios would result in an increase of less than 10% (over existing activities) in the number of vehicle maneuver miles which occur to support training at PTA. Live-fire training would increase minimally as CS units conduct training in support of BCT training exercises, as a majority of firing activities during these exercises are conducted by combat maneuver elements.

Scenario 3 & 4: Growth by 3,000 Additional Combat Support or Combat Service Support Soldiers

Live Fire and Maneuver Training: Units stationed in Hawai'i under these scenarios would conduct small unit maneuver training (squad, platoon and company) and live-fire qualifications on the Island of O'ahu at USAG-HI training sites. CS and CSS units would deploy to PTA to support large unit maneuver events at the battalion and brigade level. CSS units would participate in limited fashion providing logistical support and other functions to combat units as they conducted live-fire training exercises. During maneuver rotations, CSS unit support would involve primarily hauling and logistical support to resupply BCT and CS units during maneuver training rotations.

CS units would conduct a higher percentage of off-road maneuvers and would support BCTs during integrated maneuver training events. Under both CS and CSS stationing scenarios discussed, the number or frequency of maneuver rotations at PTA would not be anticipated to change, though more vehicles may participate in maneuver training events to ensure all units maintain optimal training readiness. Both stationing scenarios would result in an increase of less than 25% (over existing activities) in the number of vehicle maneuver miles which occur to support training at PTA. Live fire training would increase minimally as CS units conduct training in support of BCT training exercises, as a majority of firing activities during these exercises are conducted by combat maneuver elements.

Scenario 5: Impacts from Aviation Gunnery into the impact area and from upgrade of the range. Also increased use of airspace and aviation support of maneuver rotations at PTA.

Range Construction: Under this stationing scenario, the Army would upgrade its existing aerial gunnery Range 20 in the impact area at PTA and expand the footprint and boundaries of the range. To access the range, aircraft would depart from WAAF on a route approved for military flight traffic. Figure 4.4-2 below shows the existing location of the aerial gunnery range that would be upgraded. Additional targetry and Aviation Weapons Scoring System (AWSS) technology would be added to the expanded aviation gunnery range footprint as part of this stationing scenario, in support of brigade weapons qualifications. The volume of firing activities as part of this stationing scenario would increase considerably (more than double) with the increased training and live fire requirements of a full aviation brigade.

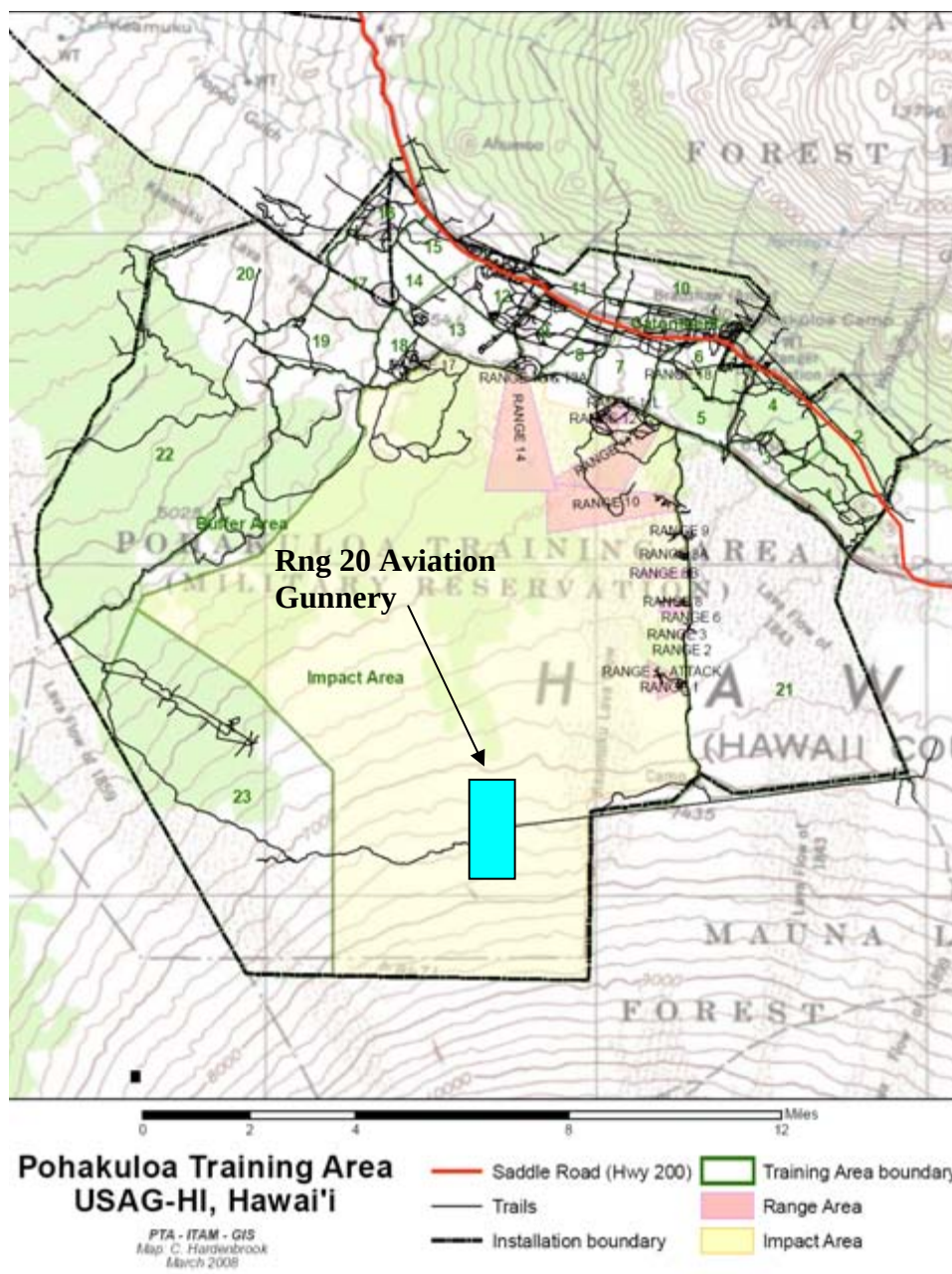


Figure 4.4-2. PTA Aerial Gunnery Range

Live Fire Activities: Helicopter crews would engage in aerial gunnery tasks on the aviation gunnery range (Range 20). Aviation crews would conduct aerial door gunnery qualification with machine guns and crews would practice diving fire ground engagement tasks with machine guns and training ordnance rounds. An increase in volume of machine gun and training rocket fire would be anticipated on these ranges and an elevated risk for wildfires in the impact area. Range 20 is currently located within the PTA impact area. UXO is currently on this range site and the area of proposed expansion for the range site. This UXO would need to be cleared for construction expansion. The range is currently used for aviation gunnery, but the volume of live-fire and training ordnance usage would more than double on this range.

1
2 *Maneuver Use:* The aviation brigade would use designated routes to depart from WAAF and
3 access training areas at PTA. The brigade would conduct a majority of its aviation maneuver
4 tasks at PTA and would utilize airspace at PTA during maneuver and while supporting
5 maneuver training events. Maneuver of ground equipment that accompanies the brigade would
6 primarily be on roads, trails and improved surfaces. Ground equipment would gather at
7 designated locations to conduct Assembly Area operations (logistics and maintenance) in
8 support of aviation units supporting BCT maneuver rotations. Helicopters would work with light
9 infantry units to transport and insert Soldiers during maneuver training rotations. Helicopters
10 would land primarily on designated hardened sites.
11
12

4.4.2 PTA Affected Environment and Environmental Consequences

This section discusses the existing baseline conditions for each environmental resource as well as the anticipated consequences to PTA should the Army implement one of the stationing scenarios discussed in Chapter 4.4.1.

4.4.3 Air Quality

4.4.3.1 Affected Environment

There are no permanent air quality monitoring stations located near PTA. The closest permanent air quality monitoring station is located at Hilo and Kona. The station at Hilo primarily collects data on sulfur dioxide and PM₁₀ levels; and the station at Kona primarily collects only sulfur dioxide levels (monitoring for PM₁₀ was suspended in June 2000). The major activities contributing to air emissions at PTA include at a package rock crushing facility (only used when needed), military vehicles, aircraft flight operations (mainly helicopters), and the use of ordnance. Data from air monitors at PTA collected from January 2006 through June 2007 suggest maneuver training itself is unlikely to result in significant impacts. The data indicate that even during maneuver training, concentrations of PM₁₀ along PTA's boundary are below federal and state 24-hour and annual average standards (Army FEIS for Stationing of the 2/25th, 2008).

Precipitation data for the area is collected at BAAF and records an average rainfall of 16.9 inches per year (1.6 inches in June to 4.4 inches in March). There are four automated weather monitoring stations located at PTA (eastern, southern, north-central, and western portions of the training area); these are used in real-time to monitor for fire management purposes. Wind speed data is also collected here to evaluate the potential for wind erosion conditions. Soldier activities are generally concentrated in the eastern and western areas of PTA. After evaluating three years of data, the Army determined the average hourly wind speed in the eastern area to be 13 mph and a maximum hourly average wind speed of 33 mph. Wind speed did exceed 8.2 mph 75 percent of the time and exceeded the 15 mph threshold commonly associated with wind erosion processes approximately 35 percent of the time. Data from the western portion of PTA show an average hourly wind speed exceeding 4.7 mph 75 percent of the time. It should be noted that the soil types in this western area are primarily low-density silty soils and are subject to wind erosion at speeds of approximately 12 mph or higher (this is lower than the 15 mph threshold). The wind speed there exceeds the 12 mph threshold approximately 15 percent of the time.

Although Hawai'i is in attainment for PM₁₀ under the CAA the area surrounding PTA has experienced discrete events in which fugitive dust from Army operations during high-wind events resulted in the temporary evacuation of residences at Waikii Ranch. Due to these conditions, the Army invested in seven air-monitoring stations around PTA to monitor Total Suspended Particulates and PM₁₀. In January 2006, the Army installed seven air-monitoring stations around PTA (Morrow 2007). TSP was included because it is more representative of fugitive dust than the finer, inhalable PM₁₀. The monitors were installed as close to PTA's boundaries as access and safety would allow. Between January 29, 2006 and June 30, 2007, the monitors sampled PM following the EPA's once-every-6-days schedule. Analysis of the data collected during the sample period indicates that concentrations of particulate matter at PTA under current activity levels are well within federal and state air quality standards (Morrow 2007). The 24-hour PM₁₀ concentrations at the seven sites ranged from 0 to 72 µg/m³ with a mean value of 7.2 µg/m³ for all sites. The federal and state standards for PM₁₀ are 150 µg/m³

(24-hour) and $50 \mu\text{g}/\text{m}^3$ (annual average). The 24-hour TSP levels ranged from 1.4 to $132 \mu\text{g}/\text{m}^3$ for all sites with an annual mean of $14.4 \mu\text{g}/\text{m}^3$. Although there are no longer federal or state standards for TSP, the former standards were the same as the PM_{10} standards cited above.

4.4.3.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Maneuver Training. The increase in military vehicle engine emissions would add to the NO_x , CO, SO_x , and particulate matter released to the environment; as well as increases in the effects from opacity to the areas nearby range roads. Unit generators would be used at PTA and would also add to the NO_x , CO, SO_x for several weeks per year during maneuver training rotations. Large amounts of time during maneuver training rotations are spent with minimal vehicle activity, as operational planning is conducted. The limited number of vehicles involved in these stationing scenarios, and limited amount of time that vehicles are generating emissions during maneuver rotations at PTA are not anticipated to result in significant impacts to maneuver training. It is anticipated that there would be only a small net increase in ozone precursor emissions to have a measurable effect on ozone levels, they would not affect the attainment status of the area. Further analysis of air quality impacts will be needed following unit stationing decisions, when composition of the unit and its vehicles and equipment are further understood.

CSS and CS units would travel on roads, military trails and could potentially travel off-road due to certain training requirements. Maneuver activities for these units could reduce vegetative cover and could lead to increased susceptibility to wind erosion.

Data from air monitors at PTA collected from January 2006 through June 2007 suggest maneuver training itself is unlikely to result in significant impacts. The data indicate that even during maneuver training, concentrations of PM_{10} along PTA's boundary are well below federal and state 24-hour and annual average standards (Army FEIS for Stationing of the 2/25th, 2008). The Army's ITAM program would mitigate potential wind erosion problems by providing management tools that would help limit damage to vegetation from vehicle maneuver activity.

An increase in Soldiers maneuvering at PTA would generally increase the risk to igniting wildfires (e.g., from hot exhaust pipes in dry areas or from human factors). While this is a risk, the stationing of these units and their participation in on-going maneuver rotations at PTA do not appreciably elevate this risk. The installation would continue to implement elements of its IFWMP and other institutional programs to counter these risks.

Live-fire Training. The risk of wildfires from live-fire activities would not increase appreciably at PTA with the implementation of these stationing scenarios. As CS and CSS units would conduct individual weapons qualification on O'ahu ranges it would be anticipated that these stationing scenarios would have limited impact to fire-risk at PTA. Emissions generated through wildfires include hydrocarbons, PAHs, and other compounds released into the atmosphere. The amount of these materials would depend on the type of vegetation affected (grasses versus trees) and the size of the burned area. The IFWMP for Pohakuloa and O'ahu Training Areas was finalized in October 2003. The Army will fully implement this plan for all existing and new training areas to reduce the impacts associated with wildland fires and resulting in less than significant effects.

CSS (3,000), CS (3,000): (Significant but Mitigable).

Maneuver Training. The increase in military vehicle engine emissions would add to the NO_x, SO_x, and particulate matter released to the environment; as well as increases in the effects from opacity to the areas nearby range roads. Unit generators would be used at PTA and would also add to the NO_x, CO, SO_x for several weeks per year during maneuver training rotations. Large amounts of time during maneuver training rotations are spent with minimal vehicle activity, as operational planning is conducted. Under these stationing scenarios, further analysis of air quality impacts will be needed when composition of the unit and its vehicles and equipment are further understood.

CSS and CS units would travel on roads, military trails and could potentially travel off-road due to certain training requirements. Maneuver activities for these units could generate additional particulate matter, particularly on dirt trails, and off-road maneuver or any surface excavation by CS units could reduce vegetative cover and could lead to increased susceptibility to wind erosion.

Data from air monitors at PTA collected from January 2006 through June 2007 suggest maneuver training itself is unlikely to result in significant impacts. The data indicate that even during maneuver training, concentrations of PM₁₀ along PTA's boundary are well below federal and state 24-hour and annual average standards (Army FEIS for Stationing of the 2/25th, 2008). The Army's ITAM program would be projected to substantially mitigate potential wind erosion problems by providing management tools that would help limit damage to vegetation from vehicle maneuver activity.

An increase in Soldiers maneuvering at PTA would generally increase the risk to igniting wildfires (e.g., from hot exhaust pipes in dry areas or from human factors). While this is a risk, the stationing of these units and their participation in on-going maneuver rotations at PTA do not appreciably elevate this risk. The installation would continue to implement elements of its IFWMP and other institutional programs to counter these risks.

Live-fire Training. The risk of wildfires from live-fire activities would not increase appreciably at PTA with the implementation of these stationing scenarios. The frequency of these exercises would not be anticipated to increase as a result of CS or CSS units stationing. As CS and CSS units would conduct individual weapons qualification on O'ahu ranges it would be anticipated that these stationing scenarios would have limited impact to fire-risk at PTA. Emissions generated through wildfires include large amounts of PAHs and other compounds released into the atmosphere. The amount of these materials would depend on the type of vegetation affected (grasses versus trees) and the size of the burned area. The IFWMP for Pohakuloa and O'ahu Training Areas was finalized in October 2003. The Army will fully implement this plan for all existing and new training areas to reduce the impacts associated with wildland fires and resulting in less than significant effects.

Combat Aviation Brigade (2,800): (Significant but Mitigable).

Training Range Infrastructure Construction. Renovation of the existing aerial gunnery range could temporarily increase fugitive emissions from activities; however, because the range is located approximately 2 miles from the installation boundary (at the closest point) (see Figure 4.4-2) there would be no expected effects to off-post locations.

1 *Live-fire Training.* Live-fire training would involve the release of emissions from rockets and
2 small munitions items at the firing point; and the release of munitions constituents at the point of
3 impact (depending on the munition items). Impacts from ordnance detonation (depending on
4 the munition item) may also kick-up dirt and dust temporarily. .

5
6 As a result of an increase in munitions use at PTA from aviation gunnery and qualification
7 activities, there would be an expected potential significant risk of igniting wildfires. Due to the
8 size and function of munitions items used on these aircraft, the greater blast radius resulting
9 from explosion would dramatically increase the risk of igniting fires. Unlike the fires that could
10 occur on small arms ranges (where personnel would be relatively closer and could respond
11 more quickly) the fires that could occur on an aerial gunnery range (if vegetation is not properly
12 managed) could be unmanageable if personnel are not on-site to quickly respond. The greater
13 the size of the burn site the more emissions (PM, PAHs, etc.) that could be released.
14 Additionally, the smoke clouds could travel for miles (potentially off-post) resulting in air quality
15 impacts to off-post residents. The installation would continue to utilize firebreaks and/or fuel
16 breaks (and other fire control measures including range design features) in order to mitigate
17 potential effects and limit the spread of wildfire. For example, the use of dip ponds would
18 increase the availability of water for helicopter fire suppression.

19
20 There would also be emissions resulting from controlled burns that are employed to manage
21 vegetation on ranges (where fires could result from live-fire activity) and to prepare areas for
22 UXO clearance.

23
24 *Maneuver Training.* Long-term effects would occur from an increase in helicopter flights from
25 WAAF to PTA. Mobile source emissions would need to be accounted for as part of an annual
26 emissions inventory, which is required of title V permit holders, or for a general conformity
27 review or a PSD (NSR) review. Increased aviation maneuver and support of combat maneuver
28 units would result in an increase loss of vegetation from “rotor wash” as helicopters approach
29 the surface of the ground and a temporary increase in PM and fugitive dust emissions. These
30 impacts would be temporary and would not occur near any residential areas. The Army’s ITAM
31 programs would be used to mitigate for loss of vegetative cover attributable to maneuver
32 damage and air quality problems resulting from increased PM loading in the air at PTA.

33 34 35 36 **4.4.4 Airspace**

37 **4.4.4.1 Affected Environment**

38
39 Much of the airspace above the northern half of the island of Hawai`i, where PTA resides, is
40 controlled airspace of various classes. Class G airspace extends from the surface to 700 feet,
41 except around Kona and Hilo International Airports and BAAF, which are surrounded by Class D
42 airspace (USAG-HI 2004). PTA has one special use airspace area that is restricted up to
43 30,000 feet; its use is intermittent. Restricted areas denote the existence of unusual, often
44 invisible hazards to aircraft, such as artillery firing, aerial gunnery, or guided missiles.
45 Consequently, flights from non-participating civilian or military aircraft are prohibited during
46 certain training exercises. The Island of Hawai`i has no formal published military training routes.

47 48 49 **4.4.4.2 Environmental Consequences**

50
51 **CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (No impact).**

1
2 *Maneuver and Live Fire Training.* No additional impacts to airspace at PTA would occur
3 through decisions to implement these stationing scenarios.
4

5
6 **Combat Aviation Brigade (2,800): (Less than Significant).**
7

8 *Training Range Infrastructure Construction.* No effects to airspace are anticipated from
9 upgrading and expanding Range 20 at PTA.
10

11 *Live-fire and Maneuver Training.* The frequency of aviation gunnery activities and the need to
12 intermittently restrict civilian air-traffic in the (R-3103) air corridor would more than double with
13 the implementation of this stationing scenario. Training activities of the aviation brigade would
14 be coordinated with the FAA and other state agencies as required. Given that lack of issues
15 with utilization of airspace at PTA, the stationing of additional aviation units in Hawai'i would not
16 be projected to significantly impact use of airspace resources at PTA. The maneuver corridor
17 between WAAF and PTA would continue to be utilized, and no additional airspace would be
18 required.
19
20
21

22 **4.4.5 Cultural Resources**

23 **4.4.5.1 Affected Environment**
24

25 PTA is part of a larger cultural landscape that includes Mauna Kea and Mauna Loa, and
26 includes the Saddle area between them. The cultural significance of the area has been, over
27 time, recorded and clarified by numerous researchers including Kepā Maly (1999), Charles
28 Langlas (Langlas *et al.* 1999), and Holly McEldowney (1982). The area encompassing the
29 lands on and between the mountains of Mauna Kea and Mauna Loa is one of the most sacred
30 areas to Native Hawaiians; and evidence suggests the occupation and use of this area
31 beginning in the 10th century. The heiau on the slopes of Hualalai south of PTA is said to have
32 been built by a legendary chief in the early 17th century. This chief and his father are credited
33 with unifying the island and creating the traditional system of land division. The chilly heights of
34 the Saddle and the peaks are not thought to have been the locations of permanent residences,
35 but many groups routinely embraced the natural resources there. Much of the PTA zone
36 provided a rich resource for bird hunting (for feathers and meat), quarrying for volcanic glass,
37 and lithic workshop areas for finish work on Hawaiian ko'i or adzes known to be produced from
38 Mauna Kea basalt.
39

40 Archaeological studies (summarized in the Programmatic Environmental Assessment for
41 Construction of Large-scale Fence Units at PTA (USAG-HI, May 2006)) suggest that ancient
42 Hawaiians practiced different economic activities in the uplands area of PTA. Radio-carbon
43 dating in caves in that region indicates occupation between the 12th and 18th centuries, and a
44 few reports indicate the presence of burials at PTA. Some studies suggest that Native
45 Hawaiians planted sweet potato crops in stony areas (Reinman and Schilz 1999), but more
46 recent work supports the hypothesis that excavated pits were created to enhance economically
47 important bird (petrel) habitat (USAG-HI, May 2006).
48

49 In the late 1800s parcels of the PTA area was owned by ranchers raising cattle and sheep. A
50 lease to the Kaohe lands of PTA was held by John Parker II from before 1876 through 1891.
51 The Waimea Grazing and Agricultural Company leased Humuula east of PTA around 1860 to

1 raise sheep and hunt wild cattle. By 1891, the Humuula lease was held by the Hackfields
2 Humuula Sheep Station Company. The Hackfields also obtained the lease for the east side of
3 Kaohe. After 1900, Parker obtained control of the Humuula Sheep Company and controlled
4 most of the saddle.

5
6 Surveys at PTA and the Keamuku Parcel have located 383 known prehistoric and historic
7 archaeological sites. Modified natural features such as lava tubes, lava blisters, and lava
8 shelters make up the most common archaeological resources at PTA. Other resources include
9 cairn sites, trails, volcanic glass quarries, excavated pits, and lithic workshops. Most of the
10 known archaeological sites at PTA are Native Hawaiian sites reflecting traditional activities. A
11 few sites may have ritual aspects. Seven known stone shrines remain that bear evidence to
12 ritual activity in the area.

13
14 The DPW Buildings List includes 138 structures at PTA that are already or soon will be 50 years
15 old. A survey and condition assessment has been completed, and an MOA for treatment of the
16 structures is currently being developed. These structures include Quonset huts dating from
17 1955 to 1958. All of the structures from the late 1950s should be treated as being 50 years old.
18 Other structures in the built up area of PTA (including BAAF) date from World War II or the Cold
19 War era.

20
21 An ethnographic study is currently being planned for PTA. Several studies of the Mauna Kea
22 area document this area, which remains significant to Native Hawaiians.

23 24 25 **4.4.5.2 Environmental Consequences**

26 27 **CSS (1,000), CSS (3,000): (Less than Significant).**

28
29 *Live Fire and Maneuver Training.* CSS unit training activities at PTA is projected to have only
30 minor impacts on PTA's cultural resources. These units would not engage in live fire weapons
31 qualification on existing ranges at PTA nor would any additional ranges be constructed at PTA.
32 The likelihood of maneuver damage from CSS units' support of maneuver training at PTA is
33 minimal as these units transport supplies and logistics across roads, trails and previously
34 disturbed areas. There is a possibility for encountering an unidentified cultural resource while
35 units are conducting Assembly area activities, but this would not be likely. If a new cultural site
36 were identified, areas around known sites would be designated as no-use areas for training and
37 protective measures would be placed around sites to avoid impacts. Monitoring of known sites
38 by cultural resource personnel would continue to occur to ensure that the site protection
39 measures are working, and to adjust protection if needed.

40
41 The frequency of maneuver training rotations at PTA would not change with these stationing
42 scenarios and Native Hawaiian access to cultural resources would not be further restricted from
43 the implementation of this training scenario. The Army would continue to provide Native
44 Hawaiians with access to traditional religious and cultural properties, in accordance with AIRFA
45 and executive Order 13007, on a case-by-case basis. Given the mitigations and limited
46 changes stationing of these units would have on PTA, the overall impact to cultural resources is
47 assessed as minor.

48 49 50 **CS (1,000), CS (3,000): (Less than Significant).**

1 *Live Fire and Maneuver Training.* CS unit training activities at PTA is projected to have less
2 than significant impacts on PTA's cultural resources. No range construction would be
3 conducted at PTA under these scenarios, however, and firing ranges have been surveyed for
4 cultural resources. CS units are not likely to damage any new cultural resources.

5
6 The likelihood of maneuver damage from CS units' support of maneuver training at PTA is
7 minimal, though it is greater than described above for CSS scenarios. There is a possibility that
8 CSS units could encounter undocumented resources during training. If a new cultural site were
9 identified, areas around known sites would be designated as no-use areas for training and
10 protective measures will be placed around sites to avoid impacts. Therefore, training activities
11 are not likely to increase impacts to archaeological resources. Monitoring of known sites by
12 cultural resource personnel would continue to occur to ensure that site protection measures are
13 working, and to adjust protection if needed. Leaders will also receive cultural resource
14 awareness training to ensure they can report the identification of cultural resources to USAG-HI
15 cultural resource management personnel to identify and take the proper actions, which would
16 likely involve marking and avoidance.

17
18 The frequency of maneuver training rotations at PTA would not change with these stationing
19 scenarios and Native Hawaiian access to cultural resources would not be further restricted from
20 the implementation of this training scenario. The Army would continue to provide Native
21 Hawaiians with access to traditional religious and cultural properties, in accordance with AIRFA
22 and executive Order 13007, on a case-by-case basis. Given the mitigations and limited
23 changes stationing of these units would have on PTA, the overall impact to cultural resources is
24 assessed as less than significant.

25 26 27 **Combat Aviation Brigade (2,800): (Less than Significant).**

28
29 *Training Range Infrastructure Construction.* Range construction involves grubbing vegetation,
30 grading site surfaces, excavating subsurface, and moving heavy construction equipment. All of
31 these activities, particularly excavation, could result in direct damage to or destruction of
32 archaeological or cultural resources. Destruction, damage, or restricted access to previously
33 unknown properties of traditional importance could occur. Mitigation measures currently in
34 place at PTA would minimize impacts to cultural resources. While the expansion of the aviation
35 gunnery range would occur in a relatively small footprint, it could be reasonably anticipated that
36 some cultural resources may exist and could be disturbed through the process of UXO
37 clearance and ground disturbance. Site protection plans for both the short-term protection
38 during UXO clearance and construction and, long-term treatments related to training would be
39 developed in consultation with the Native Hawaiian community and other interested parties.
40 The garrison will avoid building on known sites, and as part of this scenario the garrison staff
41 would conduct Section 106 Consultation with the State Historic Preservation Office, the Office of
42 Hawaiian Affairs, and appropriate Native Hawaiian organizations/individuals. Wherever
43 possible, avoidance during design would be used to prevent any impacts to cultural resources
44 which were identified.

45
46 *Live-fire and Maneuver Training.* The increase in munitions items and weapons use (rockets,
47 missiles, machine guns) elevates the risk of damage to resources. Rockets and missiles
48 require a much larger surface danger zone than do machine guns and do more damage to soils
49 upon explosion. In addition, fire caused by aviation gunnery activity could impact some cultural
50 resources, and expansion of the aviation gunnery range and UXO areas could limit future
51 access to unidentified cultural resources.

As discussed for CSS stationing scenarios, maneuver impacts to cultural resources would be projected to be less than significant, as ground vehicles associated with aviation units would remain road and trail bound, and conducting limited assembly area activities of resupply and maintenance.

4.4.6 Noise

4.4.6.1 Affected Environment

There are limited noise data available for PTA. The dominant sources of existing noise include military aircraft (mostly helicopters), vehicle traffic, and ordnance use during live-fire and other training exercises. NZ III is contained within the present boundaries of the training area. NZ II affects BAAF and the western portion of the cantonment area; and it extends beyond the boundaries of PTA from BAAF westward to the northwest corner of the post. Except for the cantonment area, no noise-sensitive land uses are affected by existing NZ II noise conditions. There are few Soldiers home-stationed at PTA. Soldier housing located there is used only during training exercises (Final Environmental Impact Statement for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (USAEC, February 2008)).

4.4.6.2 Environmental Consequences

CSS (1,000), CSS (3,000): (Less than Significant).

Live Fire and Maneuver Training. No additional live fire noise generating activities would be anticipated under these stationing scenarios at PTA. Maneuver impacts would cause a slight increase in noise levels along on-post roadways and military vehicle trails. Blank munitions may be fired at PTA as part of maneuver training by CSS units. The use of blank ammunition and simulator devices on West PTA may potentially create noise effects within the Waikii Ranch development and the Kilohana Girl Scout Camp, both of which share fence line boundaries with the Keamuku Parcel.

CS (1,000), CS (3,000): (Less than Significant).

Live-fire. Small arms firing can produce relatively high peak noise levels at localized areas around the range. The use of blank ammunition and simulator devices in the Keamuku Parcel area may potentially create noise effects within the Waikii Ranch development and the Kilohana Girl Scout Camp, both of which share fence line boundaries with the Keamuku Parcel. Noise from blank ammunition firing would fall below the Zone II threshold at approximately 3,500 feet for common types of small arms blank ammunition. Thus, noise from small arms firing with blank ammunition could have substantive noise effects at Waikii Ranch and the Kilohana Girl Scout Camp when training occurs within a few thousand feet of these locations. The Zone II noise at Mauna Kea State Park would expand slightly to include a small amount of land on the west side of Saddle Road, but there would be very little change in the location of the Zone II noise contour near the picnic area and rental cabins east of Saddle Road.

Maneuver Training. Maneuver training could generate low level low frequency noise along roads and trails. Off-road maneuver would be expected to occur away from noise receptor populations. The engine noise generated by armored vehicles or any tracked equipment, if it

were to accompany CS units, could generate higher frequency noise. Training simulation devices replicating artillery or other battlefield effects could also generate one-time noise events. The Army has proposed establishment of a 1,000 foot noise buffer zone around Waikii Ranch and the Kilohana Girl Scout Camp. The Army would limit night-time training activities and continue to work with the community to mitigate the impacts of noise generating activities.

Combat Aviation Brigade (2,800): (Significant but Mitigable).

Training Range Infrastructure Construction. Because the noise associated with construction equipment will generally produce levels of 80 to 90 dBA at a distance of 50 feet⁴, and the range expansion project will occur more than two miles from the installation boundary, the effects to residences or to recreational activity would be minor. The temporary nature of construction would have only temporary effects to wildlife (as discussed in Chapter 4.4.8 Biological Resources)).

Live-fire Training. Noise levels from weapons firing and ordnance detonations are quite variable, with noise levels influenced in part by weather conditions. Despite this fact, the location of the aviation gunnery range at PTA in relation to the installation boundary serves as a mitigation to noise impacts to receptor populations. While aviation gunnery activities would more than double at PTA, the location of these activities would ensure that there are kilometers of buffer area between these activities and human populations.

Maneuver Training. The impacts of helicopter maneuver between WAAF and PTA is expected to be less than significant as the flight route between the two installations largely uses buffer zones within which to fly, and mainly flies over water (ocean). The flight route may lie above some residential areas. Helicopters generally fly at low altitudes (approximately around 300 feet above ground level). An increase of an aviation brigade would result in an increase in helicopter overflights resulting in impacts to some receptors from noise. The effects to wildlife would be discussed in Chapter 4.4.8 Biological Resources.

4.4.7 Soil Erosion

4.4.7.1 Affected Environment

PTA is in the Humuula Saddle between the two major peaks on the Island of Hawai'i; Mauna Kea lies to the northeast, and Mauna Loa lies to the south. The elevation at PTA ranges from 4,030 feet amsl to 8,650 feet amsl. The slope of the Mauna Kea volcano rises to 13,796 feet amsl, and Mauna Loa to 13,678 feet amsl. The military vehicle trail rises to an elevation of approximately 250 feet amsl to near the junction of Highway 19, and continues east to rise to an elevation of about 2,500 feet amsl over a distance of approximately 10 miles. The soils at PTA are generally thin and poorly developed. Approximately 80 percent of PTA (or 88,000 acres) is covered by lava flows and presents a low soil accumulation potential due to a combination of steep slopes and high altitude. An additional 1,400 acres of land is classified as cinder land, and about 12,500 acres is classified as rock land or very stony. The remaining 10,000 acres, located along the northern boundary of PTA near Saddle Road and within training areas 1 through 17 and training area 22, are classified as volcanic deposits. The low precipitation, rapid runoff, and high altitude reduce the rate of weathering, and the steep slopes and wind tend to prevent soils from accumulating. The soils tend to have a moderate to high erosion potential.

⁴ Permissible noise exposure identified by OSHA for an 8-hour work day (29 CFR 1910.95)

Other areas of PTA are composed of fine sandy loam and highly permeable soils (FEIS for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (USAEC, February 2008)).

Most of PTA is on lava flow deposits erupted from Mauna Loa, the last eruption of which (1984) covered 16 square miles of land in 3 weeks. Basalt flows (erupted from Mauna Loa and Mauna Kea) underlie lava flow deposits. The lower half of the Keamuku Parcel is within the Waimea Plains, which were formed by lava flows from Mauna Kea. Mauna Kea butted up against the Kohala Mountains that are now covered with a blanket of volcanic ash soils. The lava at PTA is predominantly pahoehoe and aa basalt flows, scoria (cinder), and ash deposits of the Hamakua Volcano. The topography of the Keamuku Parcel is dotted with Mauna Kea volcano cinder cones lying on the upper layer of the Hamakua basalts. Basalt is covered by a layer of up to 3 feet of Pahala ash stemming from an explosive eruption period from Mauna Kea about 39,000 years ago.

The Keamuku Parcel is underlain primarily by very fine sandy loam soils belonging to the Puu Pa-Pakini-Waiaha soil association (U.S. Department of Agriculture [USDA] 1973), which developed on volcanic ash deposits. The predominant soils are Waikaloa very fine sandy loam and Puu Pa extremely stony very fine sandy loam on the lower two-thirds of the parcel; and Waikaloa very fine sandy loam, Kilohana loamy fine sand and very stony land on the upper third of the parcel. Shallow gulches dissect the parcel; the largest of these are Waikii Gulch and Auwaiakeakua Gulch. The gulches contain soft, permeable soils, which form thicker deposits in some areas, while the Puu Pa soils in other areas contain a calcium carbonate cemented layer that impedes percolation of water. Wind and water easily erode Waikaloa and Puu Pa soils.

The USAG-HI manages soil resources at PTA as they are managed at SBMR and O'ahu training sites. Conservation programs manage the soils for natural rates of runoff, erosion, and sedimentation. The INRMP for PTA for 2002 to 2006 identifies installation-specific goals and management objectives of the ITAM Program for PTA. Erosion management strategies are similar to those implemented under the INRMP for O'ahu, with the exception that site hardening involves putting down crushed lava to allow use of the area without degradation of the surrounding area. Restoration of artillery firing points has been the major area of emphasis for the LRAM program on PTA since 1996. Some of the firing points have become denuded, resulting in vegetation loss and subsequent major erosion and dust issues. PTA soil substrates are primarily fine, volcanic ash prone to wind erosion and dust.

4.4.7.2 Environmental Consequences

CSS (1,000), CS, (1,000), CSS (3,000), CS (3,000): (Less than Significant).

Maneuver Training. ATTACC modeling assumed that about 56,661 acres, or about 50 percent of the total land area within PTA, is maneuverable. Under all stationing scenarios, the total maneuver load of PTA would increase between 5-25%. Additional vehicle traffic at PTA could alter the permeability and water-holding capacity of the soils and harden silty clays. Reduced water-holding capacity and permeability adversely impacts the ability of the soils to support recovered vegetation. Because vegetation cover is a primary means of preventing soil erosion, widespread compaction could indirectly lead to increased erosion and downstream sedimentation.

Exposure to chemical contaminants in soils at maneuver training areas could occur through several pathways, including direct contact with contaminated soils, ingestion of soils, or through

1 inhalation of windblown dust⁵. Results from soils investigations at PTA in 2002 found the
2 presence of TNT (2,4,6-trinitrotoluene) and RDX (1,3,5-trinitotriazine) in some soils. The
3 observed concentrations were generally lower than industrial PRGs.
4

5
6 **CS (1,000), CS (3,000): (Minor).**
7

8 *Live-fire.* The effects on soil loss would be localized because much of the land contains shallow
9 soil or exposed rock outcrops. Removing grassland vegetation by fire would temporarily expose
10 soils to increased water erosion, but perhaps even more so to wind erosion. Due to a lack of
11 continually flowing streams, soils would probably not migrate far from their upslope origins, but
12 wind erosion could transport soil further from its original location. Many areas with soils on PTA
13 are somewhat protected from water erosion because they are surrounded by rock outcrops.
14 Due to the somewhat limited erosive effects from natural processes at PTA the effects of live-
15 fire on small arms ranges is expected to be less than significant. CSS units would not be
16 projected to have an impact to soils at PTA.
17

18
19 **Combat Aviation Brigade (2,800): (Less than Significant).**
20

21 *Training Range Infrastructure Construction.* Temporary effects would occur. Expansion and
22 modernization of the aerial gunnery range would during UXO clearance and construction would
23 resulting in clearance of surface vegetation, resulting in short-term exposure to wind and water
24 erosion. Excavated soils would be temporarily exposed to water and wind erosion on the range
25 expansion site. Construction BMPs would be used to mitigate these effects.
26

27 *Live-fire Training.* Munitions impact can directly create craters and remove patches of
28 vegetation, which normally protects soil from erosion by slowing runoff, intercepting raindrops
29 before they reach the soil surface, and anchoring the soil. Compaction in the craters caused by
30 larger ordnance explosions can alter the permeability and water-holding capacity of the soils
31 and harden silty clays affecting the ability of vegetation to recover in those areas. These direct
32 impacts indirectly create large areas of bare ground that is susceptible to wind and water
33 erosion, which can indirectly cause large-scale removal and redeposition of soils or unstable
34 slopes in areas of steep slopes and rapid runoff. Although weapons training events would be
35 periodic, long-term impacts are expected because soil disturbance typically requires time and
36 effort to amend. Implementation of the soil erosion control measures, implementation of
37 standard BMPs, and revegetation and other land restoration projects implemented by the LRAM
38 program under the ITAM annual work plan (described previously) would reduce these impacts
39 to less than significant.
40

41 Vegetation removal resulting from wildland fires could result in increased soil erosion by water
42 and wind, indirectly causing large-scale removal and redeposition of soils, gullying, or unstable
43 slopes in areas of steep slopes and rapid runoff. The impact would be directly proportional to
44 the size of the fire. Under natural conditions, wildland fires occur infrequently in Hawai'i, partly
45 due to lack of lightning. Thus, native plant species are not well adapted to fire. Fire and loss of
46 soil could reduce native plant species and encourage fast-growing nonnative species that

⁵ Exposure estimates are based on assumptions about the amount of soil that might be ingested by a person who works in an area with contaminated soils. It is a generally accepted principle of risk assessment that not all exposures result in unacceptable health risks and that there are certain thresholds of exposure below which the health risks are so low that they cannot be distinguished from background risks.

1 recover quickly after fires. Some of these species may be more susceptible, or even
2 dependent, on fire so that the occurrence of wildland fires may help to increase the chance of
3 future wildland fires. Although wildland fires could occur at PTA, the erosive processes on the
4 island would have similar effects on the transport of soils as from live-fire activities (under the
5 CS scenarios). Soil transport is somewhat limited due to a lack of surface water; therefore, less
6 than significant effects are anticipated.

7
8 Low levels of explosive residues are associated with munitions use. Studies have shown that
9 TNT residues are readily metabolized by soil microbes and the byproducts bind to organic
10 matter. Areas with higher organic matter content appear to bind residues more rapidly. The
11 explosive residues RDX and HMX do not degrade rapidly and are not very soluble; however,
12 once dissolved in water, both can be highly mobile in soil. Missiles and rockets are fired from
13 aviation firing points into designated range areas. The Army restricts access to these areas by
14 Soldiers or members of the public because of the explosive risk to safety they represent. It is
15 unlikely; therefore, that military personnel or off-post residents would come into contact with the
16 constituents of these munitions in the downrange impact area soils. The risk to military
17 personnel who use the ranges would be low because contact with downrange impacted soils is
18 unlikely. There would be no risk to the general public from munitions constituents related to
19 range use because there would be no public access to these areas. Exposure to soil
20 contaminants during live-fire training activities is considered a less than significant impact.

21
22 *Maneuver Training.* Helicopter maneuver is expected to have less than significant effects.
23 Wind generated from helicopters at frequently used landing zones can loosen vegetation and
24 soils. To minimize the erosive effects at landing zones the garrison anticipates the need for
25 hardening soils there using a mixture of soil binder, gravel, and rocks, which would work to
26 improve areas susceptible to impacts from training with attack and medium/heavy lift
27 helicopters. The installation ITAM program would continue to analyze vegetative cover loss and
28 implement projects to improve sustainability and vegetative cover of landing sites.

31 4.4.8 Biological Resources

32 4.4.8.1 Affected Environment

33
34 PTA is on the west side of Humuula Saddle, on the Big Island of Hawai'i. It is on a plateau
35 formed by Mauna Kea and Mauna Loa. The surrounding lands are mostly conservation districts
36 and managed or leased by the State of Hawai'i and variety of private landowners.
37 Approximately 38 percent of the plants found on PTA are indigenous or endemic. There are 24
38 vegetation communities on PTA. Numerous introduced plant species make up a significant
39 portion of many of these habitats, and introduced plants are components in all habitats on PTA.
40 Approximately 62 percent of the plants found at PTA are introduced species. Barren lava
41 covers 25 percent of the installation. Lichens, such as *Stereocaulon vulcani*, and ferns, such as
42 *Pellaea ternstroemia*, are the first colonizers of these flows, though fountain grass is invading barren
43 areas.

45 Vegetation

46
47 There are four types of *Metrosideros* treeland, ranging from sparse to mixed intermediate. The
48 dominant canopy vegetation in these areas is generally ohia. There are three types of
49 *Dodonaea* shrubland: open, dense, and mixed. The remainder of the native natural
50 communities is a combination of *Chamaesyce*, *Myoporum*, and *Sophora* species, with divisions
51 based on the densities of species.

PTA has federal and state listed noxious weeds. Invasive and noxious weeds that are targeted for control on PTA include banana poka (*Passiflora mollissima*), fountain grass, fireweed (*Senecio madagascarensis*), and Russian thistle (*Salsola kali*). Other widespread weed species are controlled where they threaten native plants and communities (Implementation of the 2003 Biological Opinion, Pohakuloa Training Area, Hawai'i, January-December 2006 (U.S. Army Garrison Hawai'i, August 2007)).

Threatened and Endangered Species

Fourteen federally-listed plants endangered plants and nine species of concern are found at PTA and the Keamuku Parcel. A complete list of these plants is found in Appendix B, Threatened and Endangered Species.

Annual bird monitoring has detected 15 species of birds throughout PTA. Native forest bird species are found within forested areas of PTA. Five federally-listed endangered bird species historically occurred at PTA. Of these five species, only the 'io and nēnē have been recorded in the past 5 years at PTA. Although palila have not been recorded at PTA in recent years critical habitat was designated for this species within PTA in 1977. A total of 24,356 ha (60,185 ac) of critical habitat (Figure 4.4-3) were designated for palila on the Island of Hawai'i; 1,707 ha (4,218 ac) were designated on PTA along the northeastern boundary. The primary constituent elements of the critical habitat are large and intermediate-sized māmane and naio trees, enough space for the population to expand, and the full range of altitudinal and geographical sites needed by the palila for normal life cycle movements and response to shifting seasonal and annual patterns of flowering, seed set, and ensuing pod development of māmane (U.S. Army Garrison Hawai'i, August 2007).

Historic artifacts discovered on the east side of PTA indicate that native Hawaiians may have harvested seabirds by creating artificial nesting sites, and studies indicate that the endangered dark-rumped petrels once bred in large numbers at PTA. A study conducted in 1995 detected dark-rumped petrels flying over the eastern half of PTA and southeast of PTA, along the upper slopes of Mauna Loa. Petrels or other seabirds, have not been detected at PTA in the last eight years (U.S. Army Garrison Hawai'i, August 2007).

The endangered, 'ōpe'ape'a, or Hawai'ian hoary bat (*Lasiurus cinereus semotus*) is distributed throughout PTA. Hawai'ian hoary bat is the only native terrestrial mammal in Hawai'i, and it is federally listed as endangered. While the bat species has historically been documented throughout the islands of Hawai'i, Moloka'i, Maui, O'ahu, Kaua'i, and possibly Kaho'olawe; resident breeding populations are now found only on the islands of Hawai'i and Kaua'i. Current and historical populations are unknown, but the population is believed to have declined over the past 100 years. During 2007, the installation conducted a full-scale, year-round installation-wide Hawai'ian hoary bat monitoring program. As a result, the study found that the bats make three altitudinal migrations throughout the island of Hawai'i each year; and have been detected in three habitat types, low shrub, open high shrub, and treeland with grass or bare lava understory. To date, not enough data has been collected to calculate occupancy rates. Studies to more accurately characterize bat migrations, changes in occupancy, seasonal behavioral differences, and population estimates is ongoing. Further monitoring in the Keamuku parcel has been recommended. Further information on the Hawai'ian hoary bat can be found in the

1 “Implementation of the 2003 Biological Opinion, Pohakuloa Training Area, Hawai’i, January-
2 December 2006” (U.S. Army Garrison, August 2007)⁶.

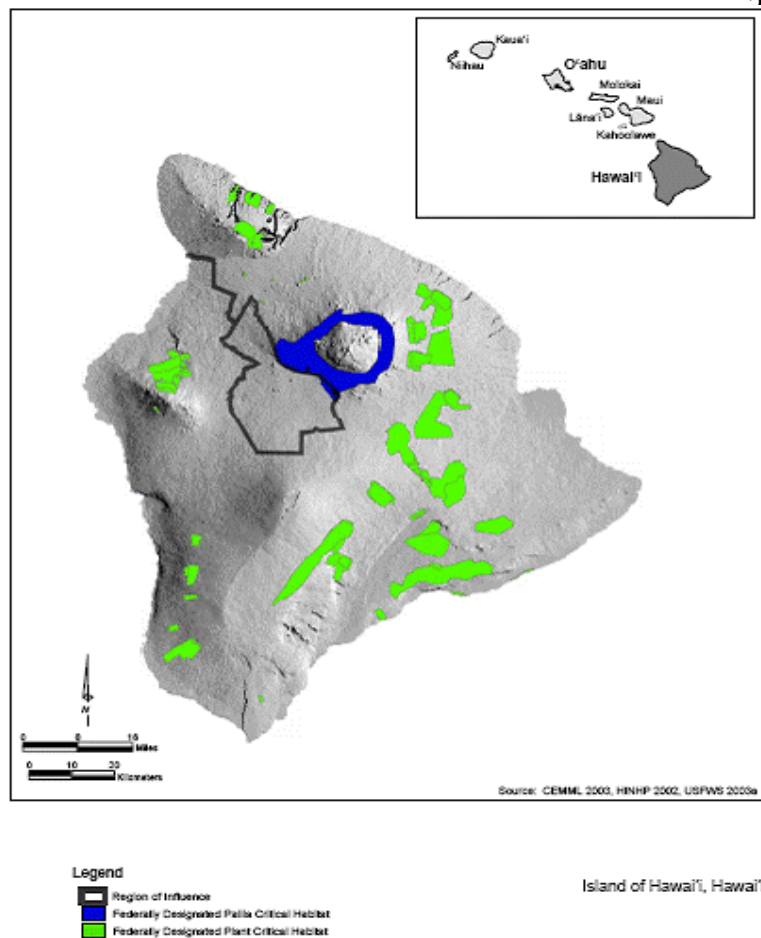
3
4 No specific reptile surveys on PTA have been conducted because there are no native terrestrial
5 reptiles and amphibians on the Hawaiian Islands.

6 **Fire Management**

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9 In accordance with a 2006 Memorandum of Agreement (MOA) between the U.S. Army and the
10 Waikii Range Homeowners’ Association, the Keamuku parcel (discussed as West PTA
11 Acquisition Area under the MOA) requires the Army to manage the parcel as an Intensive Fire
12 Management Zone to alleviate concerns regarding potential impacts associated with military
13 training. The MOA also requires several mitigation measures to be conducted by the Army,
14 ensuring such impacts do not occur to the extent possible.

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⁶ The February 2008 covers study findings for January through December 2007. The report is currently in Draft form.



36 **Figure 4.4-3. Palila & plant critical habitat on Hawai'i**

39 **4.4.8.2 Environmental Consequences**

41 **CSS (1,000), CS (1,000): (Less than Significant).**

43 *Maneuver Training.* The impacts to biological resources from implementing these stationing
 44 scenarios are determined to be less than significant. The movement of more vehicles and
 45 Soldiers on PTA ranges would however, increase the risk of introducing invasive plant species
 46 (from seeds carried on equipment), elevate the risk of removing vegetation resulting in impacts
 47 from soil erosion and creating opportunities for noxious or invasive weed species to become
 48 established; and increasing the risk of igniting wildfires. Additionally, the increase in vehicles
 49 maneuvering at PTA is anticipated to increase the dust (and opacity issues) generated in
 50 training areas. Because these units would not increase the number of maneuver rotations at
 51 PTA, and maneuver would occur primarily on roads and trails within the footprint of existing
 52 maneuver areas, these risks are reduced to less than significant.

CS (1,000): (Significant but Mitigable).

Live-fire. Both live- and nonlive-fire training would slightly increase, resulting in the increased potential for wildfires. Wildfires damage and remove vegetation resulting in an increased risk of soil erosion, and creating opportunities for invasive plant species to become established in locations where native plants once existed. Similar to training areas on O'ahu, PTA uses firebreaks and controlled burns to mitigate potential adverse effects from wildfires; to reduce the opportunity for wildfires to start; and to ensure that if fires are ignited they may be manageable. Use of the installation's IWFMP, which provides best practices and SOPs during training events, would help ensure that the risk of igniting wildfires is less than significant.

CSS (3,000), CS (3,000): (Significant but Mitigable).

Maneuver Training. There would be an elevated risk of wildfire, noise impacts, soil disturbance, and effects from the introduction or establishment of noxious or invasive weed species. Due to the greater number of Soldiers that would be maneuvering under these scenarios the risks would be elevated to significant. The installation would continue to follow procedures and guidance for proper training and resource management under the installation's INRMP, IWFMP, IPMP, and other established best practices, which would ensure that most impacts associated with training are mitigable.

CS (3,000): (Significant but Mitigable).

Live-fire. Range use at PTA is proposed for current active ranges. Impacts to native vegetation and habitats are expected to be mitigable. Human presence and elevated noise levels resulting from increased range use would displace various wildlife species; however, impacts to wildlife would not be different than the impacts from current operations. Increased noise is not expected to affect wildlife because field surveys have shown that it is not a significant factor in behavior and does not affect reproductive success (U.S. Army Engineering District Honolulu 2000). Conversely, however, Nene geese are present at Range 1 of the range complex for part of the year. Nene geese have been reported to be sensitive to aircraft noise (Ward et al. 1999). With the implementation of BMPs or mitigation measures, it is anticipated that the impacts to general wildlife and habitats from live-fire exercises would be less than significant.

Combat Aviation Brigade (2,800): (Significant Adverse).

Training Range Infrastructure Construction. Range construction would be concentrated in the upgrade of Aerial Gunnery Range 20. Due to an increase in the range's footprint and additional construction, some species may be displaced from their current habitats. It is expected that these displaced species would adapt to their new locations. Noise from construction activities would increase temporarily. Construction equipment and materials can introduce invasive species and other weeds to PTA. Impacts from noxious weeds from range construction could be significant. New range construction would require Section 7 consultation with USFWS.

Live-fire and Maneuver Training. Noise impacts to biological resources are expected to significantly increase. Although wildlife has been demonstrated to adapt to changes in noise, some species may have a more difficult time adapting to the increase in ordnance use and helicopter overflights. Further site-specific analysis may be required.

The incidence of wildfire may increase as a result of training. The effects from live-fire training may be reduced by implementing BMPs and through proper range design and siting. The level of activity associated with a Combat Aviation Brigade may require more intense monitoring and may require the addition of more firebreaks, and other design features that would help to minimize the occurrence of wildfire, the effects are anticipated to be significant adverse.

4.4.9 Wetlands

4.4.9.1 Affected Environment

No wetlands have been identified at PTA.

4.4.9.2 Environmental Consequences

No impacts to wetlands resources are anticipated at PTA from the implementation of stationing scenarios.

4.4.10 Water Resources

4.4.10.1 Affected Environment

Watersheds

On the Island of Hawai'i, there are few defined watersheds due to young, highly permeable rock and soil deposits that generally absorb the precipitation without forming stream channels. The exception is along the island's northern coast, where streams are better defined. The climate at PTA is classified as cool and tropical. PTA ranges experience an average rainfall of 10 to 16 inches annually. PTA lies within the Northwest Mauna Loa and the West Mauna Kea watersheds. There are no surface streams, lakes, or other waterbodies within PTA boundaries due to low rainfall, porous soils, and lava substrates. Rainfall, fog drip and occasional frost are the main sources of water for the biological resources found on PTA. There are no perennial streams within 15 miles of PTA; however, at least seven intermittent streams drain surface water off the southwestern flank of Mauna Kea and lie within the same drainage area as PTA.

Few data on surface water quality are available for the PTA watersheds. As stated above, there are no perennial streams within PTA. According to the 303(d) List of Impaired Waters in Hawai'i prepared under the Clean Water Act none of the streams in the PTA are listed as impaired.

Water Supply

Water must be trucked into PTA. The nearest source of potable water is approximately 19 km (12 miles) northwest of PTA and it is not likely that this source of water exists beneath PTA (Department of the Army 1990). Potable water wells that tap into the basal aquifer are found at lower elevations on the Island of Hawai'i.

Wastewater

Wastewater treatment in Hawai'i is done by wastewater treatment plants and by underground injection control. There is no wastewater treatment plant on PTA.

Stormwater

The cantonment and airfield areas of PTA, north of Saddle Road, are on land that slopes gently to the west. Under some circumstances, the runoff from the south slope of Mauna Kea could exceed the drainage capacity of the area and result in temporary flooding or localized ponding; however, the soils in the area are permeable, and the underlying lava flows contain sufficient secondary permeability that infiltration to the subsurface is rapid. Infrastructure at PTA is currently sufficient to meet the needs of the Army.

4.4.10.2 Environmental Consequences

All stationing scenarios: (Less than Significant).

No cantonment construction or activities significantly increasing water demand at PTA are proposed under any stationing scenario nor would there be any significant increases in wastewater generating activities. Existing waterways may be impacted with increased sediment loading from maneuver activities, though the type of maneuver activities and extent of their increase would not be projected to cause large increases from existing sediment inputs to surface waters. The installation would continue to monitor vegetative cover and implement institutional mitigation programs, such as ITAM to limit sediment loading of surface waters.

4.4.11 Facilities

4.4.11.1 Affected Environment

PTA land is a mixture of fee simple, leased and ceded lands. PTA is the largest Army training area in Hawai'i, totaling 107,873 acres. Land uses at PTA include the Cantonment area, BAAF, maneuver training areas, drop zones, live-fire training ranges, artillery firing points an ordnance impact area, and areas unsuitable for maneuver. The Cantonment area consists of 566 acres with 154 buildings, mostly Quonset huts.

BAAF has a 3,969-foot runway and offers helicopter access and limited C-130 access. Land suitable for field maneuvers consists of approximately 56,661 acres and the ordnance impact area is approximately 51,000 acres.

The Keamuku Parcel, consisting of approximately 24,013 acres is owned by USAG-HI and is currently used for cattle grazing, limited hunting, occasional military maneuver training, and a quarry is found there. UXO hazards along the Saddle Road corridor (extending approximately 164 feet [50 meters] from the road) need to be cleared to a safe depth to support the heaviest track and wheeled vehicle that will use the area. The USACE indicated that the overall ordnance and explosives hazard level for the Keamuku Parcel is low.

Public Services

PTA is the only Army facility on Hawai'i that has its own medical and fire facilities. PTA also has its own police facility. In most instances, emergency medical services and law enforcement are regionally provided.

4.4.11.2 Environmental Consequences

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Minor).

Maneuver Training. Minimal long-term adverse effects are expected because of increased demand for potable water at the maneuver training areas. Additional potable water would need to be trucked in, as there is no water distribution system.

CS (1,000), CS (1,000): (Minor).

Live-fire. There are adequate facilities to accommodate these scenarios. Only a minor increase in ammunition would be expected, resulting in more ammunition to be transported to PTA for live-fire activities. As no ammunition storage facilities (or storage for spent brass casings) are located at PTA minor effects are expected.

Combat Aviation Brigade (2,800): (Minor).

Training Range Infrastructure Construction. Temporary minor effects from range expansion and modernization is expected due to the need to tie-in new targetry and digital technology (AWSS) to the existing range infrastructure. Additionally, the electricity required to run range targetry may be generated from a 50-kW photovoltaic power system (provided by HELCO in cooperation with the Army). As this technology is only in the demonstration phase, temporary power outages may occur for a variety of reasons, resulting in temporary effects to training.

Live-fire Training. Long-term beneficial effects would occur from the range expansion and the use of more accurate scoring technology.

Maneuver Training. No additional effects would occur. There is adequate space at PTA to accommodate these aircraft; only minor modifications to airspace would be needed; and no changes to maneuver corridors would be expected.

4.4.12 Energy Demand/ Generation

4.4.12.1 Affected Environment

Hawaiian Electric and Light Company (HELCO) provide electrical power to the Island of Hawai'i. Each island must be completely self-sufficient in terms of electrical generation and transmission. Unlike states on the mainland, electricity cannot be imported from the grid, not even from the neighboring islands. Thus, HELCO and independent producers who sell HELCO electricity must generate enough to meet each day's demand. In addition, HELCO needs back-up or reserve generating capacity to allow for planned maintenance and unexpected loss of generation.

The demand for electricity is increasing throughout Hawai'i due to an increasing population and increasing energy usage from the average consumer. The Army is trying to reduce its demand for electricity in Hawai'i. New buildings and facilities are designed with energy-saving features and construction. The Army also is looking at renewable sources and projects as a means to reducing demand for electricity such as the use of photovoltaic technology. As part of a demonstration, HELCO and the Army has established a 50-kW photovoltaic power system project at PTA for range targets, control towers, and airstrip lighting.

4.4.12.2 Environmental Consequences

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Minor).

Maneuver Training. Long-term effects would occur. Soldiers utilizing the cantonment area during large-scale training exercises would result in a minor increase in power demand and cost for electrical service.

CS (1,000), CS (1,000): (Minor).

Live-fire. There would be an expected slight increase in power demand on live-fire ranges resulting from the increase in Soldier training. The incorporation of photovoltaic technology may have slight beneficial effects due to a long-term cost savings and reduction of reliance on other (less renewable) power sources.

Combat Aviation Brigade (2,800): (Minor).

Training Range Infrastructure Construction. Due to the installation of photovoltaic there may be a slightly beneficial effect on electricity demand at live-fire ranges.

Live-fire Training. The increase in live-fire exercises would increase demand on the power system; these effects would be minor due to the renewable nature of the energy source.

Maneuver Training. No effects on energy demand would occur as a result of an increase in maneuver; however, similar to CS and CSS scenarios, Soldiers utilizing the cantonment area would result in a slight increase in energy demand and cost.

4.4.13 Land Use Conflict/ Compatibility

4.4.13.1 Affected Environment

No housing units are located at PTA. The garrison currently has plans for upgrading and constructing facilities and infrastructure at PTA; and constructing or renovating runways or roadways at BAAF and PTA.

PTA consists of 132,784 acres of land which is a mixture of leased, ceded, and fee simple. This is the largest training area in Hawai'i and supports helicopter training and live-fire, maneuver training (56,661 acres), drop zones, artillery firing, and an ordnance impact area that is approximately 51,000 acres. PTA also supports a cantonment area and BAAF. The cantonment area is approximately 566 acres. The airfield accommodates helicopters and has a 3,969 foot runway with limited access for C-130s. The lands surrounding the training area is largely state-designated Conservation District and land uses include game management, cattle grazing, forest reserves and undeveloped land. To the northwest of PTA land is agricultural and provides some hunting; to the north lies the Kaohe Game Management Area, the Mauna Kea Forest Reserve, Mauna Kea State Park, and the Mauna Kea National Natural Landmark; and to the east and south is the Mauna Loa Forest Reserve (Final EIS for the Permanent Stationing of the 2.25th Stryker Brigade Combat Team (USAEC, February 2008). Figure 4.4-4 depicts land ownership at and surrounding PTA.

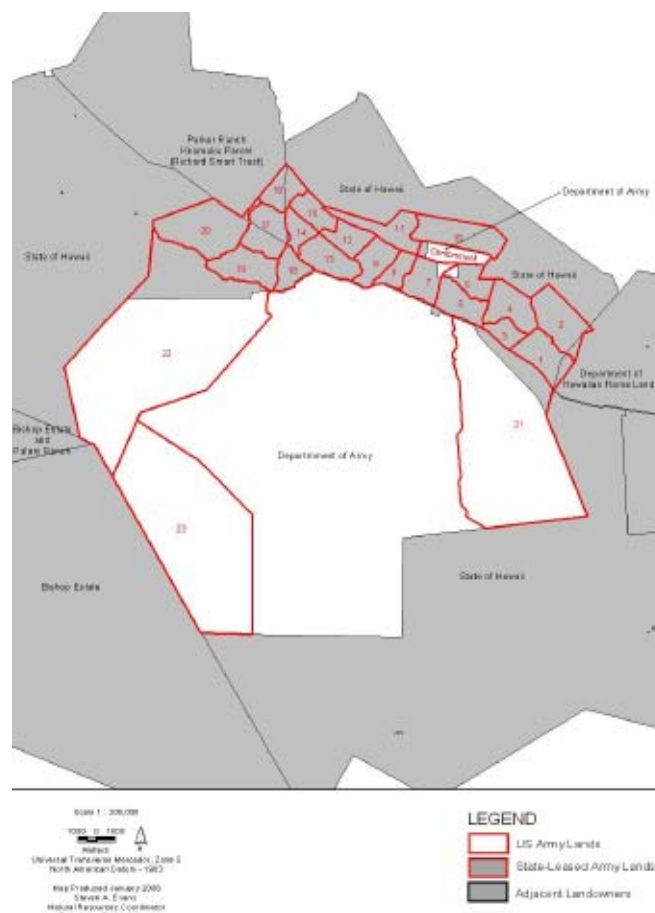


Figure 4.4-4. Land Ownership Surrounding PTA

4.4.13.2 Environmental Consequences

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Minor).

Maneuver Training. Increased noise, dust, or other indirect effects associated with this alternative are not expected to adversely affect off-post land uses. No residential areas, schools, hospitals, or businesses are expected to be affected. These impacts would be localized to the vicinity around the maneuver areas, roads, and trails.

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Less than Significant).

Live-fire. Noise from small arms firing with blank ammunition could be incompatible with land uses adjacent to the installation border. For example, noise could affect the Waikii Ranch and the Kilohana Girl Scout Camp when training occurs within a few thousand feet of these locations. Due to the distance between these locations the effects are anticipated to be less than significant.

Combat Aviation Brigade (2,800): (Less than Significant).

Training Range Infrastructure Construction. Range expansion would indirectly affect nearby land uses as a result of increased noise, dust, odors, adverse effects on public views, and human presence and activity in the construction sites. These impacts would be localized and temporary. In addition, UXO may be present at the aerial gunnery range; range expansion and construction could be preceded by Army-sponsored surface and subsurface clearance (if necessary) and followed by ordnance health and safety monitoring during construction in order to reduce potential exposure and impacts from this project. Although UXO presents a significant impact, USAG-HI would follow proper abatement techniques, which, when accompanied with proper training on UXO identification and handling, would reduce the impact to less than significant.

Live-fire Training. Although there would be an increase in machine gun and ordnance use at PTA, off-post areas would not experience any noticeable increase in noise; however, the range expansion and increase in training could impose restrictions on some nearby recreational use. Because the Army would continue its cooperative efforts with the state to provide access to their lands the resulting effects may be less than significant.

Maneuver Training. There would be an increase in helicopter overflights between WAAF and PTA, resulting in an increase in noise in off-post land uses. Because these overflights would occur infrequently, the expected impacts would be less than significant.

4.4.14 Hazardous Materials/ Hazardous Waste

4.4.14.1 Affected Environment

Hazardous waste at the USAG-HI is tracked and grouped into the following categories lumped by how they are generated: Ammunition, Live-fire, and UXO; Petroleum, Oils, Lubricants (POL), and Storage Tanks; Contaminated and Installation Restoration Program (IRP) sites; Lead; Asbestos; PCBs; Pesticides and Herbicides; Radon; and Hazardous Wastes.

Ammunition, Live-fire, and UXO: Live-fire training occurs at PTA, and includes artillery and mortar training (incorporating bags of explosive propellant and charges⁷). There is designated surface danger zones (SDZs) associated with live ammunition firing at range training facilities. SDZs at PTA are configured toward a cumulative ordnance impact area (approximately 51,000 acres) in the central portion of the installation. In addition, although improved conventional munitions⁸ (ICMs) are no longer used on Army training lands due to the extreme safety risk they pose. PTA has a 16,800-acre ICM impact area within the larger impact area. This area is not accessible to the public. Permanent ammunition storage is not authorized on PTA. During training, ordnance is temporarily stored in ammunition holding areas. When training is completed any unused ammunition is returned to the ammunition storage point located on WAAF; this area acts as permanent ordnance storage for all of USAG-HI (Final EIS for the Permanent Stationing of the 2.25th Stryker Brigade Combat Team ((USAEC, February 2008)).

Ammunition is transported from WAAF to PTA via boat or helicopter 8 or 9 months of the year. If transported via boat, the ammunition is driven from Kawaihae Harbor to PTA. There have been no accidents involving the transport of ammunition in the last 5 years.

Results from recent soil sampling at PTA ranges produced some samples with levels above USEPA Region IX residential and industrial PRGs. Five samples from PTA exceeded the PRG for RDX. Lead concentrations of two samples from Ranges 9, 10, and 11 exceeded the industrial soil PRG. The exceedances of heavy metal PRGs are attributable to naturally occurring high background levels. Although metals such as aluminum and iron occur naturally in Hawaiian soils, byproducts of munitions, such as lead and RDX, contribute contaminants that could create health and safety concerns in the natural environment. Hazardous waste is transferred to the PTA transfer and accumulation point facilities for proper storage until disposal contractors and the DRMO coordinate to ensure proper disposal.

Unexploded Ordnance (UXO)⁹ at PTA includes grenades, mortars, and artillery weapons used during live-fire training; all other ammunition is considered inert. When a live-fire training range is closed, all UXO is normally destroyed by explosive ordnance disposal (EOD) units 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 maneuvering in those areas. Due to the suspected low level of UXO however, it is not cleared before maneuvers commence. Soldiers are taught how to identify UXO and how to handle it properly.

Petroleum, Oils, Lubricants (POL), and Storage Tanks: Industrial operations responsible for POL are generally centralized in motor pools. Industrial grade fuel is generally transported from Hickham AFB and stored in ASTs. USAG-HI currently maintains and uses oil/water separators throughout the garrison, where needed, with the exception of PTA (and KTA). PTA does have a septic tank system which is permitted by the HDOH.

⁷ Charges that are not used during training are typically burned, generally creating a residue. Residues from burned propellant are the only hazardous wastes that are temporarily stored at the range burn site in a designated hazardous waste satellite storage point

⁸ also considered cluster bombs because these items are munitions that contain multiple smaller sub-munitions

⁹ Defines in DoD 6055.9 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.”

IRP Sites: There are several IRP sites within the Hawai'i installations including at PTA. An investigation was performed to evaluate contamination in surface soil and water samples from the SBMR and PTA firing ranges. Secondary explosives compounds, primarily TNT (2,4,6-trinitrotoluene) and RDX (1,3,5-trinitotriazine), which are the major ingredients in nearly all munitions items formulations, were found on ranges at both installations. Also found at both locates were aluminum, iron, lead, and antimony, and semi volatile organic compounds (SVOCs). These were found at levels exceeding USEPA Region IX PRGs.

Depleted Uranium (DU) was found in August 2005 during the cleanup of unexploded ordnance (UXO) from a range located on SBMR. Follow-up surveys identified other locations where DU was found. The source of this DU 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.

Lead: PTA buildings have not yet been surveyed for lead. Lead can also be found in live-fire ranges on PTA; but the garrison has in place BMPs for lead mitigation and erosion at small arms ranges.

Asbestos: All buildings constructed prior to 1980 are suspected risks for asbestos, and upon identification of renovation or demolition projects these buildings are surveyed for asbestos-containing material.

PCBs: PCB concentrations in soil samples from PTA were below the listed PRG (FEIS for Permanent Stationing of the 2/25th Stryker Brigade combat Team (USAEC, February 2008)). 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.

Pesticides and Herbicides: These materials are commonly used throughout USAG-HI installations to prevent and mitigate pest-related health problems and maintain grounds and structures. At PTA these materials are stored at one location in approved containers.

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 picocuries per liter, and thus there is not much concern at this location.

Hazardous Wastes/Biomedical Waste: The medical clinics on PTA produce small amounts of regulated chemical and medical waste. Biomedical waste is collected and disposed of in accordance with AR 200-1, and is disposed of at a regulated off-base disposal site.

4.4.14.2 Environmental Consequences

CSS (1,000), CSS (3,000): (Less than Significant).

Maneuver Training. Maneuver training would be conducted in the same training area locations as are presently used. Although no live-fire training is conducted in these areas the existing presence of UXO is suspected from past military usage. Although UXO presents a significant

1 impact, USAG-HI would follow proper abatement techniques, which would reduce this impact to
2 acceptable. In addition to these mitigation measures, the Army would continue to educate
3 Soldiers on how to identify UXO and the proper safety procedures for handling UXO resulting in
4 less than significant effects.

5
6 No increased fuel storage (above present levels) may be required as a result of these
7 scenarios. Transportation of personnel and use of flammable or combustible materials, such as
8 fuel or ordnance (i.e., weaponry or equipment), could increase the potential for spills or releases
9 of hazardous materials. BMPs would be utilized and personnel would follow USEPA and
10 USAG-HI protocol for using and handling hazardous materials, such as POLs. All facilities at
11 USAG-HI maintain strict SOPs and spill contingency plans for hazardous materials and waste,
12 identifying specific operating responsibilities and procedures.

13
14 Pesticides and herbicides would continue to be used where needed at PTA. These stationing
15 scenarios are not expected to increase the use of these materials at PTA. Pesticides and
16 herbicides would continue to be managed by DPW in accordance with the USAG-HI IPMP, and
17 pesticides would continue to be stored at the Environmental Shop on PTA. This impact is
18 considered less than significant.

19
20
21 **CS (1,000), CS (1,000): (Less than Significant).**

22
23 *Live-fire.* Ammunition use would increase compared to existing conditions. The ammunition
24 would be maintained and managed by the administration in accordance with federal and USAG-
25 HI protocol, therefore creating no additional significant impact. Handling and storage methods,
26 disposal protocols, and safety procedures would continue to be conducted in accordance with
27 existing regulations; therefore, the increase in ammunition is expected to result in less than
28 significant impacts.

29
30 Furthermore, when Soldiers train at the ranges, safety protocol must be followed in order to
31 protect the public from injury or accidents. SDZs are set up in accordance with Army Pamphlet
32 385-64, Ammunition and Explosive Safety Standards. In order to prevent conflict with
33 recreational activities in areas near the training ranges, land use restrictions are set up to limit
34 access to the areas during range training times. Additionally, similar safety protocol must be
35 implemented to protect Army personnel during range training. Soldiers are given safety
36 manuals with a complete discussion of safety procedures while training. In addition, before
37 training, Soldiers are briefed on range-specific safety measures that may be necessary during
38 the special exercise. Finally, Soldiers and officers are provided with field manuals for each
39 specific operation and exercise that give more detailed procedures and protocol to be followed
40 in order to prevent accidents.

41
42
43 **Combat Aviation Brigade (2,800): (Less than Significant).**

44
45 *Training Range Infrastructure Construction.* UXO may be present at the aerial gunnery range;
46 range expansion and construction could be preceded by Army-sponsored surface and
47 subsurface clearance (if necessary) and followed by ordnance health and safety monitoring
48 during construction in order to reduce potential exposure and impacts from this project.
49 Although UXO presents a significant impact, USAG-HI would follow proper abatement
50 techniques, which, when accompanied with proper training on UXO identification and handling,
51 would reduce the impact to less than significant.

1
2 Additionally, range modernization and expansion may redistribute lead material from that will be
3 removed or retained within the range soils. Due to the lack of surface water at PTA and the
4 properties of lead, these materials do not migrate well. These areas are expected to contain
5 significant quantities of lead. Unused lead contaminated soils would be remediated in
6 accordance with applicable federal and state standards.

7
8 *Live-fire Training.* Live-fire training would continue to add lead and other hazardous materials to
9 the soils, and potentially UXO. Use of ordnance would be consistent with current uses at the
10 range complex, and is not anticipated to pose a significant impact on human health.

11
12 *Maneuver Training.* A certain amount of POLs and fuel storage would be required at PTA to
13 support aircraft maneuver. Best practices would be employed at these storage locations and
14 personnel would follow USEPA and USAG-HI protocol for using and handling hazardous
15 materials.

16 17 18 19 **4.4.15 Traffic and Transportation**

20 **4.4.15.1 Affected Environment**

21
22 The ROI for roads at PTA includes the PTA trail; which is the corridor between PTA and
23 Kawaihae Harbor. PTA Trail is approximately 26 miles long and is bounded by State Road 190
24 on the east, and the coastline on the west.

25
26 The major urban areas on the island of Hawai`i are Hilo and Kailua-Kona, which are on the east
27 and west sides of the island, respectively. Air service for these centers is provided by Hilo
28 International Airport and Kona International Airport. Generally, major roadways in Hilo are
29 congested, and major highway improvements are underway to address these problems. There
30 are several congested areas in Kailua-Kona, but the periods of congestion are short. The most
31 direct roadway link between these population centers is Saddle Road, but most motorists use
32 Queen Kaahumanu Highway (Highway 19) because this road has better design features.
33 Saddle Road is not up to current design standards, and sight distances are limited. The HDOT,
34 with the Federal Highways Administration as the lead agency, have construction projects in
35 progress to improve Saddle Road. The first of these projects is a 7-mile segment from Mauna
36 Kea State Park towards Hilo, which was dedicated in May 2007.

37
38 Major roadways on the island are under the jurisdiction of the HDOT. Roadways under the
39 jurisdiction of HDOT are Queen Kaahumanu Highway, Mamalahoa Highway, Hawai`i Belt Road,
40 Volcano Highway, and Kawaihae Road. Except for limited sections, these roadways are two-
41 lane highways. Major intersections are signalized. The remaining local roads and streets are
42 under the jurisdiction of the County of Hawai`i Department of Public Works.

43
44 Current traffic conditions in Hawai`i vary depending on location, but are typically over capacity
45 during peak hours, resulting in significant traffic delays. These traffic delays occur in urban
46 areas with multi-lane roads as well as less developed areas with only two-lane roads (Final EIS
47 for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team ((USAEC, February
48 2008)).

49 50 51 **4.4.15.2 Environmental Consequences**

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Less than Significant).

Maneuver Training. The frequency of maneuver training at PTA is not expected to significantly increase above existing levels. For large maneuvers, vehicle convoys may present less than significant impacts to other users of PTA roads and trails. Convoys would generally travel as they would outside the installation boundary; in serials of approximately six or more vehicles moving simultaneously from one point to another under a single commander, and normally maintaining a gap of 15 to 30 minutes between serials.

CS (1,000), CS (1,000): (Less than Significant).

Live-fire. Traffic would increase slightly due to the greater number of Soldiers that would use these existing live-fire ranges; however, traffic impacts associated with intersection operations and roadway segments, and parking are expected to be less than significant.

Combat Aviation Brigade (2,800): (Less than Significant).

Training Range Infrastructure Construction. Range construction activities associated with the aerial gunnery range would generate additional traffic from worker vehicles and trucks, but due to the scope of the project, construction traffic would be relatively light (compared to typical construction activities) and would be temporary. Off-post traffic conditions would not significantly affect operations on nearby roads, and traffic would generally be free flowing, resulting in less than significant impacts.

Live-fire Training. There would be an expected increase in helicopters conducting live-fire exercises at PTA. Minor effects may occur due to a slight potential increase in scheduling conflicts for the use of live-fire ranges.

Maneuver Training. Helicopters maneuvering between WAAF and PTA would continue to use approved, existing, air traffic corridors. No additional effects are anticipated.

4.4.16 Socioeconomics**4.4.16.1 Affected Environment**

The ROI associated with the proposed stationing scenarios includes the County of Hawai'i (which incorporates the entire Island of Hawai'i), where PTA is located. There are twelve (12) districts within Hawai'i County; these are Hilo, Honokaa-Kukuihaele, Kau, Keaau Mountain View, North Hilo, North Kohala, South Kohala, North Kona, South Kona, Paauhau-Paauilo, Pahoa-Kalapana, and Papaikou-Wailea. PTA resides within the Paauhau-Paauilo CCD and small portions of the North Kona, South Kohala, and North Hilo CCDs (Final EIS for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (USAEC, February 2008)).

According to 2006 data provided by the U.S. Census Bureau the estimated population of Hawai'i County is 171,191 (with an average household size of 2.66 persons per household). Hawai'i maintains an average labor force population (ages 16 and above) of 91,433; which contributes to an estimated median household income of \$55,390. The per capita income is

roughly \$26,356. The County of Hawai'i has 75,185 housing units; of which 22,135 are renter occupied (U.S. Census Bureau Web Site, n.d.).

Within Hawai'i County, the South Kohala CCD experienced one of the greatest population growth percentages (43.7 percent in 2000). In 2000, the population of the North Kona CCD was one of the largest population centers on the Island of Hawai'i. The North Hilo CCD had the highest percentage of minority populations (71.9 percent in 2000), and North Kohala had the lowest (52.9 percent in 2000) (U.S. Census Bureau web site, n.d.). No military or civilian personnel are permanently stationed at or reside at PTA.

The school enrollment rates were provided by Garrison staff in an email dated 28 February 2008. These rates can be found in Appendix C of this document. As indicated in the Final EIS for the Permanent Stationing of the 2/25th SBCT (USAEC, February 2008), schools located near PTA are presently operating at or below capacity.

4.4.16.2 Environmental Consequences

CSS (1,000), CS (1,000), CSS (3,000), CS (3,000): (Less than Significant).

Maneuver Training. Maneuver training would have no impacts on population, economy, employment, income, housing, or schools.

CS (1,000), CS (1,000): (Less than Significant).

Live-fire. Live-fire training would have no influence to employment rates or the economy.

Combat Aviation Brigade (2,800): (Less than Significant).

Training Range Infrastructure Construction. No minority or low-income residences would be displaced by range construction; and noise and fugitive dust generated from project-related construction is not anticipated to have any adverse direct or indirect impacts outside the installation boundary. Conversely, very slight beneficial impacts may occur as a result of increased expenditures for certain materials. These impacts would be well within the capacity of the ROI to absorb.

Live-fire Training. As indicated by installation staff in a February 2008 teleconference, the primary source of noise at PTA is generated from aviation live-fire training at the aerial gunnery range; however, to date, no noise complaints have been issued from the public. Live-fire training would have no influence to employment rates or the economy.

Maneuver Training. Aircraft would continue to utilize the standard flight route leading from WAAF to PTA, which currently has a minor influence to residential areas and largely utilizes a buffer zone around WAAF to maneuver from O'ahu to the Island of Hawai'i.

4.5 Cumulative Effects for USAG-HI

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 on the environment resulting from the incremental impact of the action when added to other 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. The impact table captures the cumulative impact that would occur if the Army decided to implement different stationing scenarios at SBMR and Fort Shafter. Effects listed for Fort Shafter and SBMR are composite ratings that include the impacts at PTA that would occur as a result of implementing stationing at SBMR or Fort Shafter. In other words, the cumulative impact rating of each column, takes into account the impact of stationing both at the home-station site (SBMR or Fort Shafter) and the individual training sites to include PTA.

The cumulative impact section also assesses the impact of stationing up to 4,000 additional Soldiers in Hawai'i which is the greatest possible increase in Soldiers that could result from Army stationing as a result of this analysis. This scenario would be possible if the Army decided to station 3,000 additional Soldiers at SBMR and 1,000 additional Soldiers at Fort Shafter.

The Cumulative effects discussed in this section also includes the military actions that will be implemented as part of the stationing of the 2/25th SBCT; actions that could be implemented under Army growth, modularity, and transformation; and other military and non-military actions that have occurred, are being implemented currently, or are planned for the future.

1

Table 4.5-1 Cumulative Effects for Stationing Scenarios in Hawai'i

VEC	Location					
	Schofield Barracks 1,000 CS/CSS*	Schofield Barracks 3,000 CS/CSS*	Fort Shafter 1,000 CS/CSS*	Fort Shafter & SBMR 4,000 CS/CSS*	Combat Aviation Brigade*	No Action Alternative
Air Quality	⊗	⊗	⊗	⊗	⊗	○
Airspace	⊙	⊙	⊙	⊙	⊗	○
Cultural Resources	⊗	⊗	⊗	⊗	⊗	○
Noise	⊗	⊗	⊗	⊗	⊗	○
Soil Erosion	⊗	⊗	⊗	⊗	⊗	○
Biological Resources	⊗	⊗	⊗	⊗	⊗	○
Wetlands	⊙	⊙	⊙	⊙	⊙	○
Water Resources	⊗	⊗	⊗	⊗	⊗	○
Facilities	⊙	⊗	⊗	⊗	⊗	○
Energy Demand / Energy Generation	⊙	⊗	⊗	⊗	⊗	○
Land Use Conflict / Compatibility	⊗	⊗	⊗	⊗	⊗	○
Hazardous Material / Hazardous Waste	⊙	⊙	⊙	⊙	⊙	○
Traffic and Transportation	⊗	⊗	⊗	⊗	⊗	○
Socioeconomics	+	+	+	+	+	+

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

* SBMR and Fort Shafter Assessments include impacts to PTA that would result from stationing.

○ = Minor or No Impact

2

3

4

5

Past, present, and reasonably foreseeable future actions for the Island of O'ahu include:

6

7

Military

8

9

- Golf Course at Fort Shafter

- Consolidated Motor Pool at Fort Shafter

- Construction of Command and Control Facility, Fort Shafter

- Expand Physical Fitness Center

12

-
- Improvements to Lyman Gate at Fort Shafter
 - Improvements to Kawamura Gate at Wheeler Army Airfield
 - Funston Road roundabout
 - Construct new Ft. Shafter chapel
 - Macomb roundabout
 - 8th TSC Motor Pool and Maintenance Shop, Schofield Barracks
 - New Brigade Complex, PH I and II
 - Warrior in Transition facilities, Schofield Barracks
 - Parking structure Quad F7
 - AAFES shopping center 6
 - Central wash facility
 - Whole Barracks Renewal Program
 - Vehicle Maintenance Shop, 307th ITSB, HMR.
 - Soldier and Family Readiness Center
 - Construction of Child Development Center
 - Gate Alignments
 - Army Facility Strategy Program
 - Prescribed Burns at Army Installations in Hawai'i
 - Makua Implementation Plan
 - O'ahu Implementation Plan
 - Live-Fire Training
 - Residential Communities Initiative
 - Integrated Training Area Management (ITAM)
 - 25th ID(L) and USAG-HI Revitalization Program
 - Implementation of the Integrated Natural Resources Management Plan (INRMP)
 - Implementation of the Integrated Cultural Resource Management Plan (ICRMP)
 - Implementation of Proposed Range and Training Land Program Development Plan actions
 - Drum Road Upgrade
 - Construct Army Reserve Center Training Facility, FS Flats (Construct a 200 member training facility)
 - Air Force Housing Privatization Program
 - Air Force C-17 use at Hickam Air Force Base
 - Growth and Realignment of the Army
 - USARPAC Transformation to Warfighting Headquarters
 - 25th Infantry Division Transformation to Modular Force Structure
 - Future Combat Systems Fielding
 - Stationing of the 2/25th SBCT in Hawai'i
 - Joint training with National Guard units (including Guam), USAF, USMC
 - Growth of the USMC at Kane'ohe Bay and use of USAG-HI facilities
 - Regional SATCOM Support Center
 - Privatization of Army Lodging, TAMC
 - Construct a Post Traumatic Stress Disorder Residential Rehabilitation Program Facility, TAMC (Construct a new 13,000 SF facility to consolidate the current outpatient and inpatient services)

Non-military

- Residential Development at Koa Ridge between Pearl City and Mililani
- Central O'ahu Sustainable Communities Plan

- Construction of Navy facility at NCTAMS/Kunia Tunnel
- North-South Road
- Farrington Highway Improvement
- Renton Road Improvements (Ewa Town)
- Residential Development – up to 900 new homes at Ocean Point
- Kapolei Parkway
- Waianae Sustainable Communities Plan
- Waianae Coast Emergency Alternate Route
- North-South Road
- Kamehameha Hwy, Replacement of South Kahana Stream Bridge
- 2121 Kuhio Avenue Condominium/Timeshare Development
- O'ahu Arts Center
- Hawai'i Superferry
- Turtle Bay Resort improvements
- Light Rail Transit project

Past, present, and reasonably foreseeable future actions for the Island of Hawai'i include:

Military

- Kawaihae Deep Draft Harbor
- PTA Implementation Plan
- Growth and Realignment of the Army
- USARPAC Transformation to Warfighting Headquarters
- 25th Infantry Division Transformation to Modular Force Structure
- Vehicle Maintenance Shop, 307th ITSB
- Future Combat Systems Fielding
- Range Modernization Projects at PTA
- Joint training exercises with National Guard and allied forces
- Training by US Marine Corps Grow the Army Soldiers
- Construct Mock Airfield, PTA (construction of a mock airfield and targets within the southern portion of the PTA impact area)
- Establish Military Training Routes in the Hawaiian Island Chain & Construction of a Combat Mobility Element Facility

Non-military

- Saddle Road Realignment
- Kawaihae/Waimea Road
- New Highway
- Waimea to Kawaihae
- UXO Cleanup
- Former Waikoloa Maneuver Area and Nansay Sites
- PanSTARRS Project
- Outrigger Telescopes Project

The following sections describe the cumulative impacts to each resource that would be expected as a result of additional stationing of GTA Soldiers in Hawai'i under the scenarios presented above.

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, two incinerators for document destruction, government and personal vehicle traffic, aircraft flight operations, various equipment operations, ordnance firing and detonation during training, controlled burning on ranges, and unplanned wildfires.

Construction equipment, motor vehicle traffic, and aircraft flight activity are important sources of ozone precursor emissions. From a cumulative perspective, 1,000 Soldier (CS & CSS) stationing alternatives would do little to alter overall vehicle traffic or air traffic activity on O’ahu or Hawai’i. Scenarios to station 3,000 additional Soldiers at SBMR or an aviation brigade would contribute a greater amount of ozone precursor emissions and hazardous air pollutant emissions to cumulative air quality impacts. The identified cumulative impacts would also include several construction projects that would at least partially overlap the timeframe of construction projects needed to support the Proposed Action and stationing scenarios. Federal ozone standards have not been exceeded in Hawai’i during the past decade, despite the cumulative emissions from highway traffic, commercial and military aircraft operations, commercial and industrial facility operations, agricultural operations, and construction projects in both urban and rural areas. 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 expected to violate any state or federal ozone standards. The cumulative air quality effects on ozone or other secondary pollutants would be less than significant under stationing scenarios discussed as part of Army growth.

Climate change is largely a global phenomenon that includes actions that are outside of the Army control. Army actions in Hawai’i contribute incrementally to this global situation. Stationing the SBCT in Hawai’i would produce greater emissions of carbon dioxide and other greenhouse gasses from both the use of explosives and the running of vehicle engines. These emissions can combine with carbon emissions throughout the world to contribute to one of the causes of global warming. The Army is proactively working to reduce its overall consumption of energy and fossil fuels at all of its installations. Under stationing scenarios involving the stationing of an aviation brigade in Hawai’i, the Army would be projected to increase its emissions of greenhouse gases and its consumption of fossil fuels by the greatest relative percent. Under all stationing scenarios, the Army would continue to work to reduce its consumption of fossil fuels in Hawai’i.

Fugitive dust sources and wildfires are the major contributors to PM10 emissions. Fugitive dust sources include construction activity, vehicle traffic on unpaved roads or off-road areas, and wind erosion from areas with exposed soils. As discussed above, the identified projects that would at least partially overlap the timeframe of construction projects identified for construction and training activities that would be implemented under different Army stationing scenarios. Spatial separation among these various construction projects would minimize or eliminate cumulative PM10 effects from those projects with overlapping construction timeframes. Military training, particularly maneuver training, will be a recurring activity contributing to fugitive dust. With implementation of Hawai’i’s existing Dust and Soils Monitoring and Mitigation (DuSMMoP) impacts would reduce air quality impacts for the SBCT; however, given the resulting increase in overall PM10 levels, the uncertainties associated with any estimate of potential wind erosion

conditions, and public perceptions of the potential magnitude of this impact, the Army considers wind erosion to be a significant air quality impact. Combined with other projects, to include increase levels of training projected at PTA because of joint training and growth of the Marine Corps in Hawai'i, the cumulative air quality effects from primary air pollutants, such as PM10, could be significant.

Airspace Resources

No significant cumulative effects would occur to airspace resources under any of the stationing scenarios which the Army is considering to implement the Proposed Action. CS and CSS unit stationing will not involve any additional impact to the use of airspace in Hawai'i. If the Army were to station an aviation brigade in Hawai'i to support the Proposed Action it would impact the use of existing airspace. The Army has designated flight corridors between Wheeler Army Airfield and primary aviation training areas at PTA. The Army would be projected to utilize this air corridor more frequently. This would not represent a significant impact to airspace resources, however, as it would represent an increase in existing activity and would not interfere with current designated aviation traffic or air-space uses. None of the reasonably foreseeable future actions identified for Hawai'i would directly or indirectly affect airspace resources. Implementation of stationing scenarios and direct and indirect impacts to airspace resources would not overlap those of the reasonably foreseeable future actions in time or space for CS and CSS stationing scenarios. Without any overlap of impacts, cumulative effects are expected to be less than significant. Stationing of an aviation brigade in Hawai'i would contribute directly to impacts on use of airspace resources though its impacts, as previously discussed, could be mitigated to less than significant with proper coordination between the Army, FAA and state of Hawai'i.

Cultural Resources

There would be potential cumulative impacts on cultural resources from planned and reasonably foreseeable future projects and from the construction and training the Army would implement under all stationing scenarios, with exception of the No Action Alternative. Public concerns include access to traditional areas and the potential destruction of cultural sites and landscapes from training. Historically residential, commercial, and military development throughout the state has destroyed or damaged cultural resource sites in the State of Hawai'i.

Military construction projects at SBMR (primarily South Range), or WAAF could result in cumulative impacts to cultural resources including NRHP-eligible historic buildings, on military installations in O'ahu. Local highway projects and bridge replacements could damage archaeological resources along the road alignments.

Under the scenario of stationing an aviation brigade in Hawai'i, upgrade of the aviation gunnery range on the Island of Hawai'i could also result in cumulative impacts on cultural resources within the impact area of PTA.

There is also ongoing consultation with Native Hawaiian groups to avoid disturbance to properties of traditional, religious, or cultural significance and assure authorized access to sacred areas. No non-military undertakings are anticipated in these controlled areas. Implementation of the ICRMP is beneficial to cultural resources because of the programs for identification, evaluation, and management of cultural resources. While the Army is not aware of any direct impacts that would result from the implementation of potential stationing scenarios to

archaeological sites some may be discovered during the construction process. Construction projects to support the stationing of the 2/25th SBCT will have a projected significant impact on archaeological sites, traditional cultural property, and historic buildings. Although specific actions proposed under SBCT can be mitigated on a case-by-case basis, the overall effect of increased training, reduced access, and continued development throughout O'ahu and Hawai'i would be expected to be significant. Given these actions will be taking place during an overlapping timeframe, in addition other actions discussed in this Cumulative Effects section, the Army assesses a significant cumulative impact for all stationing scenarios.

Noise

The steady development in the state has continued to contribute to noise. Urban and military development and operations produce major noise from vehicles, aircraft, military training, and construction activities. Noise conditions near proposed activities associated with stationing scenarios 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.

Noise effects are inherently localized because sound levels decrease relatively quickly with increasing distance from the source. Cumulative noise effects would occur when multiple projects affect the same geographic areas simultaneously or when sequential projects extend the duration of noise effects on a given area over a longer period of time.

Cumulative noise effects would stem primarily from temporary construction activities and military training. Private development construction projects, highway improvement projects, and military construction projects at sites other than USAG-HI installations would not produce cumulative noise effects because of distance or differences in construction timing. Nonetheless, project-related activities will not reduce noise levels at the affected installations, but rather continue to contribute to an already significant level of noise at some on-post receptors. Therefore, the cumulative noise effects would be significant under all stationing scenarios.

Soils Erosion and Geology

If the Army selects any of the stationing scenarios resulting in the stationing of additional Soldiers in Hawai'i it will 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.

Activities that disturb or remove vegetative cover are presently occurring or would occur in the reasonably foreseeable future, which would continue to result in greater soil erosion and loss than without these activities. Areas with well-developed (deep) soils have the potential to be revegetated and stabilized; however, areas with newly formed soils or shallow soil profiles may not be able to recover from soil erosion or soil loss impacts. In areas of the PTA where soils can be thin and fragile, the effects of soil loss may be irreversible. Maintaining a persistent vegetative cover in areas of intensive use or development would not be possible because of the nature of the proposed use. Under stationing scenarios involving Combat Support (CS) Soldiers, the direct impacts and cumulative addition to adverse soils impacts in Hawai'i would

1 be projected to be limited, but still significant given all of the actions taking place in Hawai'i and
2 at PTA. If the Army chooses to station an aviation brigade in Hawai'i, the increased aviation
3 traffic of helicopters, particularly in drier local climates encountered at PTA, will increase the
4 loss of soils from wind erosion.

5
6 In light of past, ongoing, and reasonably foreseeable future actions, the cumulative soil erosion
7 impacts associated with all action alternatives could be locally significant. Combined with
8 regional-level soil loss, project-related impacts are expected to be cumulatively significant. The
9 implementation of BMPs, as required by federal and state regulations, will reduce the
10 cumulative impact, but not to a less than significant level.

11
12 Seismic or volcanic eruption hazards could result in cumulative effects if, for example,
13 evacuation of personnel or treatment of casualties were to overwhelm the capacity of the
14 available infrastructure. The most likely site for severe seismic or volcanic impacts to occur is at
15 PTA, where the seismic and volcanic hazards are greatest. The Army is expected to have
16 internal capacity to evacuate its personnel and to support civilian emergency response efforts in
17 a seismic or volcanic emergency.

18
19 No other cumulative geologic impacts are expected from implementation of stationing scenarios.
20
21

22 **Biological Resources**

23
24 When analyzing past, present and reasonably foreseeable future actions, the cumulative impact
25 of implementing any of the stationing scenarios in Hawai'i will be significant. Actions which will
26 be taken to station the 2/25th SBCT will result in significant biological impacts in a timeframe
27 which would overlap with the construction of projects and training that would take place to
28 implement growth of the Army needed to support Pacific Theater Operations. Some of the
29 projects identified as contributing to cumulative impacts would impact biological resources. The
30 cumulative projects are expected to contain mitigation measures and SOPs to minimize
31 potential biological impacts. How to best implement mitigation to limit adverse impacts will be
32 further assessed in NEPA which would analyze specific projects associated with this decision.
33

34 The cumulative impacts on vegetation would be less than significant. Habitat in the area is, for
35 the most part, is either already developed or disturbed natural and introduced landscapes.
36 Activities limited to this area would mostly affect nonnative species adapted to stressed or
37 nonnative environments. Other projects would have detrimental affects on vegetation in their
38 vicinity, and consequently on the species that have been supported by these habitats.
39

40 There would be a cumulative increase in the number of nonnative species resulting from the
41 implementation of stationing scenarios and the cumulative projects. Construction and increased
42 use of roads would introduce additional nonnative species and further spread those that already
43 occur on O'ahu and the Island of Hawai'i. The disturbance caused by construction and
44 demolition and the increased use of improved roads would leave the surrounding habitats
45 vulnerable to nonnative species that can thrive in conditions where native species cannot.
46 Mitigation and conservation measures associated with the Army's proposed actions would limit
47 the spread of nonnative species by washing construction and military vehicles and incoming
48 equipment into O'ahu and the island of Hawai'i. The overall cumulative impact from the spread
49 of non-native species from other proposed projects in the area could be significant.
50

Alternatives, particularly if an aviation brigade were selected for stationing in Hawai'i, would likely to contribute to cumulative effects to threatened, endangered, and special status species from habitat loss, erosion and runoff, fire, and introduction of non-native species. The cumulative effect on sensitive species that would result from project-related habitat loss and degradation would be significant. Development of land throughout the state continues to degrade special status species, but habitats throughout the state continue to support common and sensitive species of plants and wildlife. A spread of invasive plants could cause landscape changes and thereby modify habitats important to sensitive species.

There would be a cumulative increase in the potential for fire on O'ahu and the island of Hawai'i as a result of the implementation of the Proposed Action and stationing scenarios bringing new units to Hawai'i. The Army has developed and will implement an Integrated Wildfire Management Plan (IWFMP) for all locations on the Islands of O'ahu and Hawai'i to prevent and control fires. The standard operating procedures within the IWFMP will reduce the potential impacts involving wildfires; however, since there is an increased risk of wildfire which additional live-fire activities for new units adds to, that could result in an irretrievable loss of individuals of sensitive species, the Army has made a conservative determination that although the mitigation will considerably reduce wildfire risk, the impacts may not be reduced to a less than significant level. In light of historic, ongoing, and reasonably foreseeable future actions, the cumulative impacts involving wildfires are expected to be significant.

The cumulative noise and visual effects on marine wildlife would be minor. The implementation of stationing scenarios is not anticipated to increase shipping traffic between islands, as CS CSS unit stationing is not projected to increase requirements for increased frequency of combat training rotations at PTA or the amount of sea shipping transport between islands. The relatively sparse distribution of marine mammals in the portion of the area that abuts the coastline and the seasonality of many species in the project area combine to make the probability of substantive effects on marine mammals extremely low and not adverse. Stationing proposals are not expected to result in a significant cumulative effect on marine wildlife.

The cumulative impacts on general habitat and wildlife would be less than significant. Noise levels are not expected to increase to such a degree that it would be harmful to terrestrial wildlife. General vegetation and wildlife would be disturbed by vegetation removal. Habitat within the area is, for the most part, disturbed natural and introduced landscapes. Other projects would have detrimental affects on habitat in their vicinity, and consequently on the species that have been supported by these habitats. This project is expected to result in less than significant cumulative impacts on general wildlife and habitat.

Wetlands

Cantonment Construction at SBMR, South Range, WAAF and Fort Shafter could have minor impacts, though the Army will know more when specific projects are sited and designed. The Army would take all practicable measures to avoid impacts to wetlands during design and construction of all projects which would be implemented to support stationing of additional units as part of the proposed action. For the most part construction would be planned in the existing cantonment area or in elevated, previously disturbed areas away saturated soils or wetlands. The cumulative impacts involving wetlands are expected to be less than significant for all stationing scenarios.

Water Resources

Cumulative impacts to water resources could occur from the implementation of all alternatives where the Army is stationing additional Soldiers in Hawai'i. Cumulative impacts could occur wherever construction or training would take place to support stationing, within the watershed downstream of the installation boundaries (for surface water impacts), or the aquifer(s) downgradient of the installation boundaries (for groundwater impacts).

Nonpoint source pollution is recognized as one of the principal causes of degradation of surface water quality. Enforcing stormwater management regulations would help reduce pollutant loading to surface waters by requiring industrial facilities, municipalities, and military and other facilities to implement stormwater management practices to reduce their individual nonpoint source contributions of pollutants. Any contribution to pollutant loading from a source in the watershed of an impaired water body, if it is greater than natural background levels, can be regarded as substantive. With the implementation of required Regulatory and Administrative mitigation measures the Army concludes that the impacts on surface water quality from nonpoint source pollutants would be significant but mitigable to less than significant level.

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. Scenarios involving CS units (including headquarters units) are projected to have less direct and cumulative impact to surface waters, given the reduced off-road impact of their training activities and reduction in potential for sedimentation. Trace levels of explosives residues could be transported by runoff from training ranges to streams; however, the trace concentrations that have been found to be present in soils and that may be transported by runoff into stream waters are not expected to be much greater relative to background concentrations of natural organic compounds. Also, with the implementation of required BMPs under the Clean Water Act, and the other potentially cumulative actions, the Army concludes that the cumulative impacts on surface water quality from contaminated sediment suspension would be significant but mitigable to less than significant for all stationing scenarios.

The soil loss from stationing scenarios would not be expected to add substantially to the overall trend of sedimentation resulting from erosion. All construction projects that involve disturbance of more than 1 acre of land would be required to comply with stringent stormwater pollution prevention requirements. The implementation of these BMPs would also minimize the effects of chemical contaminant loading could also contribute to cumulative impacts on stream water quality. These measures would collectively be expected to mitigate potential watershed impairment impacts to less than significant levels.

Stationing scenarios are not expected to contribute greatly to a cumulative increase in the potential for flooding. Impacts from construction projects are not expected to decrease appreciably the amount of stormwater runoff retained by soils in the high-intensity short-duration storms that cause most flooding in Hawaiian watersheds.

The Army continues to address potential groundwater contaminants resulting from past practices through its Installation Restoration Program. Infiltrating surface water containing nonpoint source pollutants is not likely to have a great impact on groundwater quality because the pollutants are typically highly dilute and tend to be adsorbed or biodegraded during infiltration through soils. Spills and other accidental releases may occur from time to time and could have greater local impacts on groundwater quality. Standard operating procedures are in place to reduce the potential and impacts of accidental spills and releases.

1
2 Stationing alternatives would increase the number of Army personnel and their families and this
3 would increase water demand. In addition, operating certain new facilities could increase water
4 use. However, a new centralized wash facility is planned for FY11 would use recycled water
5 so it is possible that water use could go down for vehicle washing once the new facility becomes
6 available. These increases are not expected to be significant with respect to the overall demand
7 for water in the hydrologic units in which the stationing of additional Soldiers and their Families
8 would occur.
9

10 11 **Facilities**

12
13 Facilities availability and utilities capacity available to support stationing scenarios is not a
14 significant concern for stationing additional Soldiers at SBMR under all stationing scenarios,
15 either cumulatively or directly. Facilities constraints would be a direct significant impact in
16 stationing 1,000 additional Soldiers at Fort Shafter or those actions required to station an
17 aviation brigade at WAAF. A number of other projects would contribute cumulative impacts in or
18 near the range and cantonment projects, as well as live-fire and maneuver training, and would
19 proceed as needed at the Army installations. Cumulative impacts to facilities for would be minor
20 for stationing 1,000 additional CS or CSS Soldiers at SBMR, less than significant for 3,000 CS
21 or CSS Soldiers at SBMR and significant for stationing of an aviation brigade with impacts at
22 WAAF and 1,000 additional Soldiers at Fort Shafter.
23

24 25 **Energy**

26
27 Stationing scenarios are expected to result in less than significant impacts to the energy. A
28 number of other projects would contribute cumulative impacts in or near the cantonment
29 projects, as well as live-fire and maneuver training, would proceed as needed at the Army
30 installations. Impacts to energy use and costs could be significant but continued implementation
31 of energy conservation measures would reduce these impacts to less than significant.
32 Cumulative impacts to energy and energy demand from stationing scenarios would also be less
33 than significant.
34

35 36 **Land Use Conflict and Compatibility (including Recreational Activities)**

37
38 Implementation stationing scenarios may result in land use conflicts in the South Range area;
39 and may further restrict recreational uses due to an increase in training. Recent action by the
40 Army as part of the stationing of the 2/25th SBCT has led to development and loss of agricultural
41 land. Ongoing loss of agricultural land would continue because of regional development in the
42 State of Hawai'i and agricultural land would be lost permanently through construction at South
43 Range. Land easement for the Dillingham Trail proposed by the Army in connection with SBCT
44 stationing, in combination with past land acquisition actions by the Army, would contribute to a
45 statewide decline in farmland. Direct impacts from stationing scenarios may not result in
46 significant impacts on the conversion of agricultural land. In the State of Hawai'i, there is an
47 ongoing loss of agricultural land due to development. In light of historic, ongoing, and
48 reasonably foreseeable future actions, the Army concludes that the cumulative impacts could be
49 significant across all.
50
51

Hazardous Materials and Hazardous Waste

Under stationing scenarios for new units, the primary cumulative impacts to human health and safety would be those associated with ammunition and UXO. Training on existing ranges could further contaminate ranges with UXO, lead, or explosives munitions constituents. Given that ranges are designed for this use, this is not considered a direct significant impact. For the stationing of an aviation brigade in Hawai'i, range expansion could be required. This could contaminate areas around existing ranges with UXO, creating a safety risk to personnel. However, the footprint for live-fire activities would be contained within the expanded range footprint. UXO presents a significant impact, and proper abatement and removal techniques under EPA and USAG-HI guidelines would mitigate the impact, potentially to a less than significant level.

Significant impacts may arise from excavation or exposure to IRP sites, or from pesticides during the aerial broadcast spraying of range areas. With proper abatement procedures and conformance with existing regulations, these impacts would not be significant. All other issues are considered less than significant, would have no impacts, or the potential impacts would be handled or addressed in accordance with existing BMPs and SOPs, thus introducing no new impacts on the public or environment. Under stationing scenarios analyzed in this document, cumulative impacts associated with hazardous materials and wastes could be significant, but impacts to human health and safety are expected to be mitigable to less than significant with implementation of USAG-HI BMPs and SOPs.

Traffic and Transportation

All scenarios would add to increase 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. The frequency of training rotations would not change under all stationing scenarios analyzed in the SPEIS. 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 expected to increase because of the projected population growth and development on both O'ahu and Hawai'i; however, stationing scenarios 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.

Socioeconomics, Environmental Justice, and Protection of Children

Long-term direct and indirect beneficial cumulative effects are expected because of increased sales volume and employment in the area under all stationing scenarios. Additional increases in sales, employment, and income could also occur from other foreseeable actions. The beneficial economic effects (i.e., increased spending, employment, and income) of these actions are expected to last for the duration any construction projects. A lasting economic benefit will result from increased expenditure of discretionary income of Soldiers and their Families. Collectively, the cumulative actions would not substantially alter the current and projected trends for population, employment, income, or housing. However, cumulative impacts would be significant but mitigable to less than significant for the economy (business sales volume).

1 Schools would also be impacted by in the local regions around Fort Shafter and SBMR, by an
2 influx in new students. Impacts to schools and requirements to allocate additional space for
3 military dependents could represent a significant impact when taken together with all other
4 actions in the region.

5
6 There would be no disproportionate impacts on low-income or minority populations expected.
7 No adverse cumulative effects to the health and safety of children would be expected. To
8 minimize potential safety risks, strict adherence to applicable safety regulations and procedures
9 would continue. Construction and training activities under all alternatives would for the most
10 part, take place in areas that are off limits to the general public. Restricted areas would continue
11 to be posted with signs, or enclosed by a fence.
12
13

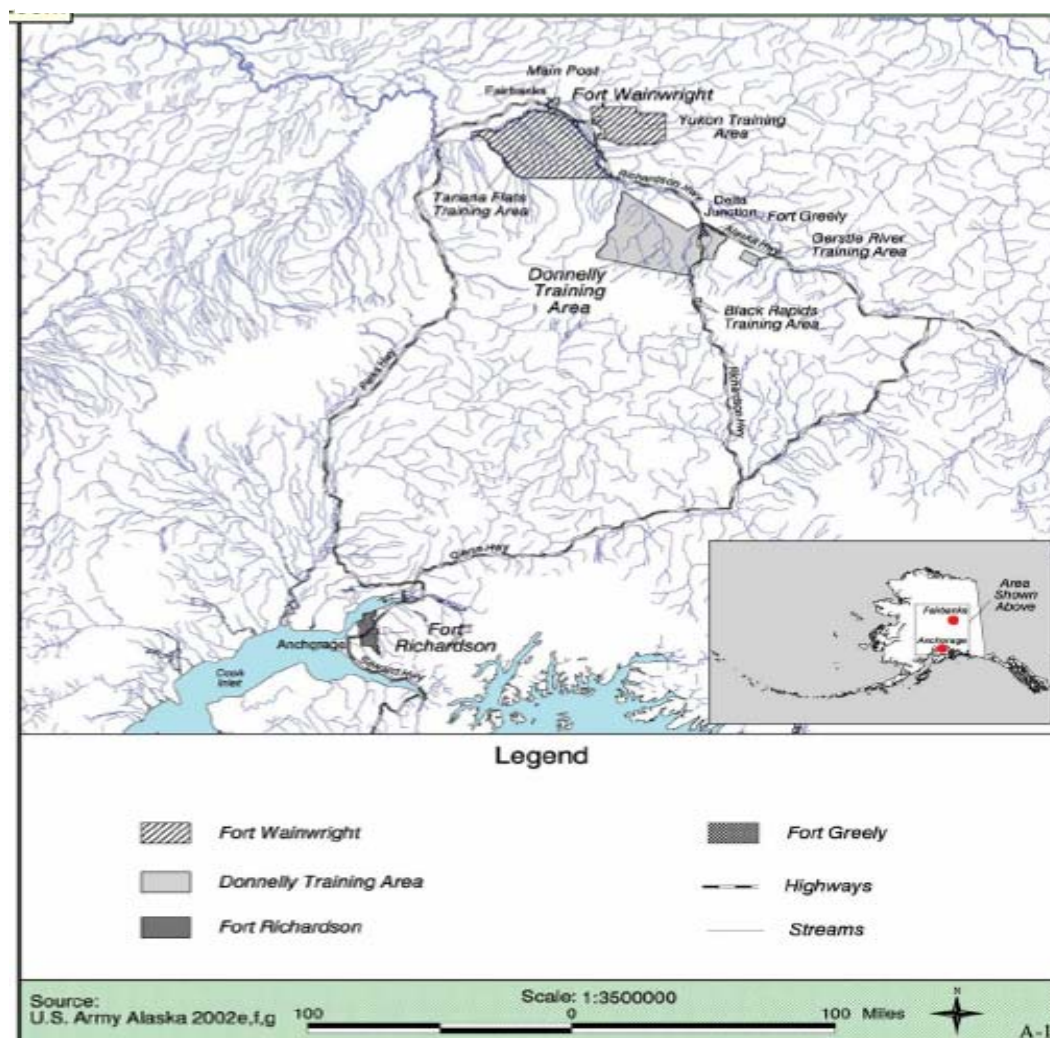
4.6 U.S. ARMY GARRISON, ALASKA

The U.S. Army Garrison, Alaska (USAG Alaska) is headquartered at Fort Richardson and consists of two Army posts (Fort Richardson and Fort Wainwright) capable of housing more than 1,000 additional permanent party and also several large training areas. USAG Alaska consists of over 1 million acres of Army training lands, and supports almost 12,000 Soldiers and 2,500 civilian employees. The USAG Alaska is in the process of transitioning to an early entry command post with the responsibility of establishing command and control of U.S. forces in a combat theater and setting the foundation of a parent operational command post that will assume command and control (USAG Alaska Web Site, n.d., 2008). Current Soldier authorizations in Alaska are listed below in the chart below.

Figure 4.6-1 on the next page depicts the locations of the two installations and their designated training areas being analyzed for Army Growth stationing scenarios in this document.

Dec 07 4th Qtr Calendar Year 2007			Civil	NAF	Total
	Military	Dependents	Service		
ARMY					
Ft. Wainwright	6,341	7,400	899	358	14,998
Ft. Richardson	5,677	7,722	842	321	14,562
Total	12,018	15,122	1,741	679	29,560

Figure 4.6-1. General locations for Fort Richardson, Fort Wainwright, Donnelly Training Area, Tanana Flats Training Area, and Yukon Training Area,



As discussed in Chapter 4.0 (Methodologies) the Army is evaluating several stationing scenarios in USAG Alaska that could result in impacts. These scenarios include the stationing of an additional 1,000 combat support or service support troops; 3,000 combat support or service support troops; or an additional fires brigade. Each of these stationing scenarios could take place at Fort Richardson or Fort Wainwright. Each of these stationing scenarios could result in environmental impacts from cantonment area construction, training range and infrastructure construction, firing range use, and maneuver training. A description of activities that would be implemented as part of each scenario is provided below:

4.7 Fort Richardson, Alaska

Fort Richardson (FRA) Summary

This section provides an overview of the actions the Army would take to implement the Proposed Action under each stationing scenario at FRA. The Army would undertake four primary types of actions to support new unit stationing. These actions include cantonment construction, training infrastructure construction, live fire training, and maneuver training activities. The discussion of environmental consequences to each resource discusses the impacts of each type of activity and assesses the combined impact of these activities on a given resource. Table 4.7-1 below lists the environmental impacts which are anticipated to occur if the Army were to implement various different unit stationing assignments to FRA to support the growth of the Army needed to support operations in the Pacific Theater. Stationing scenarios possible at FRA include the stationing of 1,000 additional Combat Support (CS) or Combat Service Support Soldiers (CSS), 3,000 additional CS or CSS Soldiers, or a new Fires Brigade. A summary of the symbology which discusses intensity of anticipated environmental impacts is provided below:

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

1

Table 4.7-1. Fort Richardson VEC Ratings

Fort Richardson					
VEC	Combat Service Support (1,000 Soldiers)	Combat Support (1,000 Soldiers)	Fires Brigade (1,600 Soldiers)	Combat Service Support (3,000 Soldiers)	Combat Support (3,000 Soldiers)
Air Quality	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Air Space	Minor	Minor	Minor	Minor	Minor
Cultural	Significant but Mitigable	Significant but Mitigable	Less than Significant	Significant but Mitigable	Significant but Mitigable
Noise	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Soil Erosion Effects	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Biological Resources	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Wetlands	No Impact	No Impact	No Impact	No Impact	No Impact
Water Resources	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Facilities	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant Adverse	Significant Adverse
Energy Demand/ Generation	Minor	Minor	Minor	Minor	Minor
Land Use Conflict/ Compatibility	Less than Significant	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable
Hazardous Materials/ Hazardous Waste	Less than Significant	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable
Traffic and Transportation	Less than Significant	Less than Significant	Less than Significant	Significant Adverse	Significant Adverse
Socioeconomics	Less than Significant	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable

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Fort Richardson Introduction

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Fort Richardson, Alaska (FRA) consists of 61,376 acres of land and is located in south-central Alaska adjacent to the cities of Anchorage, Eagle River, and nearby Elmendorf Air Force Base (AFB) (Figure 4.7-1) (USAG Alaska, 2004). The installation is home to the 4th Brigade combat Team (Airborne), 25th Infantry Division; the 17th Combat Sustainment Support Battalion; 95th Chemical Company; 716th Ordnance Detachment; 864th Engineer Combat Battalion (Heavy); and the Headquarters for the 59th Signal Battalion among other units.

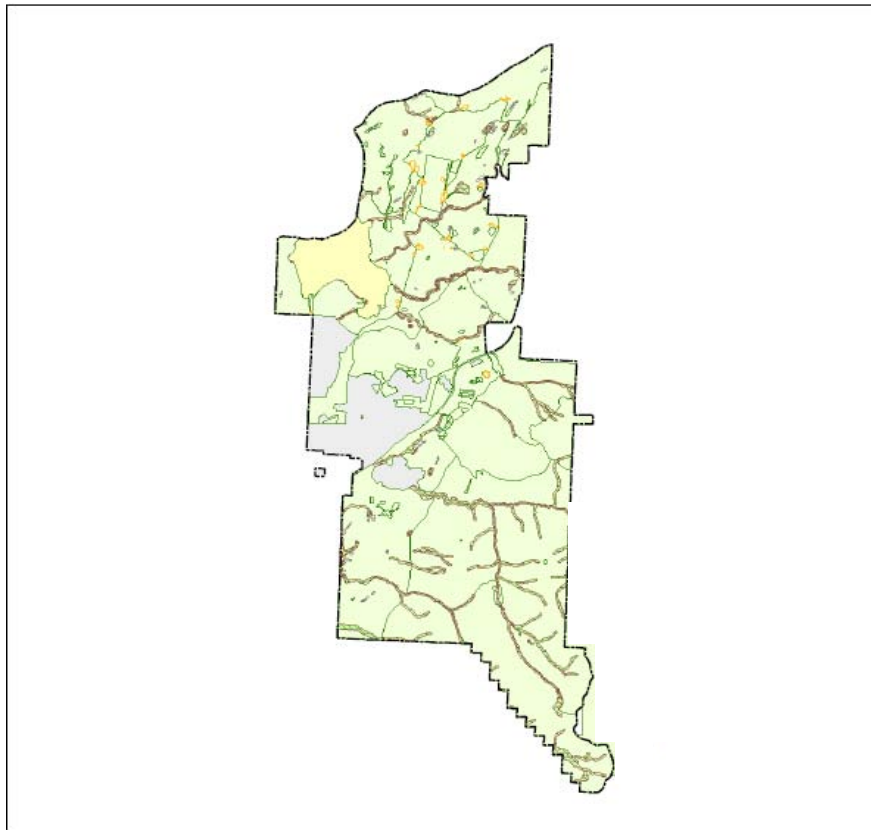


Figure 4.7-1. Fort Richardson

4.7.1 Fort Richardson Proposed Actions to Support Army Stationing Scenarios

Scenario 1: Growth by 1,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Fort Richardson. Growth by 1,000 additional Soldiers would drive requirements to demolish some existing facilities and replace them with the necessary facilities in the existing cantonment area. Cantonment construction at Fort Richardson will not require establishment of additional supporting facilities for wastewater transport, water lines, or power as existing facilities would be able to support requirements under this stationing scenario. In addition to these cantonment construction requirements, drainage projects would be sited to channel water during storm events.

Table 4.7-2 listed the space and size requirements for key facilities associated with the growth of 1,000 CSS Soldiers.

Table 4.7-2. Estimated Facilities Requirements at Ft. Richardson for Scenario 1

Garrison Facilities	Requirement
Fuel Storage (gallons)	30,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	18,000
Company Offices (sf)	12,000
Unit Storage Buildings (sf)	17,000
Barracks Space (sf)	38,800
Military Vehicle Parking (sf)	400,000
Vehicle Maintenance Shop (sf)	30,00

Range Construction: To accommodate the stationing of new Soldiers, Fort Richardson will need to upgrade several training range facilities to meet doctrinal training requirements of 1,000 additional combat support Soldiers. These Soldiers will primarily need to engage in basic marksmanship tasks and qualifications with individual and crew served weapons. As part of this scenario several ranges would be expanded to handle additional training requirements generated by this stationing scenario. No new ranges would be built but the Modified Record Fire Range, the Known Distance Range, and the Combat Pistol range would be expanded through the addition of more firing lanes to accommodate a greater number of Soldiers. Each of these ranges would be expanded at the location of the existing ranges which are currently located to the East of the Fort Richardson cantonment area. Figure 4.7-3 in scenario 4 depicts the current location of each of the ranges below. The scope of the necessary expansion and purpose of each range is described below:

Modified Record Fire Range (MRF): This range is used to train support unit Soldiers in basic marksmanship tasks. The range teaches Soldiers to quickly aim and engage stationary infantry targets. To implement the proposed action between 4 and 8 lanes would need to be added to this 16 lane range to expand its training capacity.

Known Distance Marksmanship Range (KD Range): This range is used to train Soldiers to identify and engage stationary and moving targets at a known distance. 10 – 25 additional lanes would be added to this 25 lane facility to expand the range capacity to a total of 35-50 firing lanes.

Combat Pistol Qualification Course (CPQC): This combat pistol range is used to train Soldiers to identify, engage, and defeat an array of targets using the 9mm, .38 caliber, or .45 caliber pistol. This project involves the extension of the 7 lane CPQC by 4 additional lanes for an upgraded range totaling 11 lanes to allow more capacity.

Live Fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. Firing activities would be conducted on existing qualification ranges on Fort Richardson. In comparison to the 4/25th IBCT and other units stationed at Fort Richardson, 1,000 additional CSS Soldiers would increase existing live fire requirements on qualification ranges by 10-15%. There are no new impacts that would be anticipated from these activities, though there would be a slight increase in the volume of live-

1 fire activities attributable to this unit stationing. Soils of new firing lanes constructed on existing
2 ranges as part of this scenario would be exposed to lead munitions and soils contamination
3 from live fire activities of these new units.
4

5 **Maneuver Training:** Units stationed under this scenario would not involve any appreciable
6 increase in the amount and scale of maneuver training that takes place in Alaska. CSS units
7 will support the maneuver training exercises of combat units; supporting their logistics and
8 support requirements. Off-trail maneuver by these units would be limited, with major operations
9 consisting of resupply, transport of equipment and command and control functions. A majority
10 of maneuver operations would take place at Donnelly Training Area and other USAG Alaska
11 maneuver areas. Much of this maneuver would occur on existing road and train infrastructure.
12 Additional small unit maneuver support missions at the platoon level would be supported at Fort
13 Richardson's existing maneuver sites. Off-road travel would be minimal and significant off-road
14 maneuver requirements are not anticipated.

15 16 **Scenario 2: Growth by 1,000 Additional Combat Support Soldiers**

17
18 **Cantonment Construction:** No change from Scenario 1. Cantonment construction would take
19 place in the existing cantonment area by demolition of unneeded facilities and replacement with
20 required barracks, offices, motor pools and other facilities. No upgrades to power, sewage
21 lines, or water lines would be required.
22

23 **Range Construction:** To accommodate the stationing of 1,000 new CS Soldiers, Fort
24 Richardson will need to conduct the same firing range upgrades discussed in Scenario 1.
25 These upgrades of existing ranges will allow Fort Richardson to properly meet the training range
26 certification requirements of its Soldiers. In addition to the upgrades of the CPQC, KD and MRF
27 ranges, an upgrade of the Multi-purpose Machine Gun range would be required under this
28 stationing scenario. A description of the MPMG is provided below.
29

30 **Multipurpose Machine Gun Range (MPMG):** This range is designed to train Soldiers to engage
31 stationary infantry and mobile vehicular targets with the full range of Army machine guns to
32 include the M249, M60, M240, and .50 caliber machine guns. This range would be extended
33 out to 1500m and upgraded with additional firing lanes to allow for sniper field fire and the
34 qualification of additional machine gun crews.
35
36

37 **Live Fire Training:** Training activities of CS units would primarily involve many of the same
38 weapons qualifications discussed under scenario 1, with individual (pistols, rifle and light
39 machine gun) weapons and crew served weapons qualification with heavy machine guns. CS
40 units would also be required to conduct certifications with MK-19 grenade machine gun systems
41 and also demolitions in the case of combat engineering units. Firing activities would be
42 conducted on existing qualification ranges on Fort Richardson. In comparison to the 4/25th
43 IBCT and other units stationed at Fort Richardson, 1,000 additional CS Soldiers would increase
44 existing live fire requirements on qualification ranges by 15-20%. There are no new impacts
45 that would be anticipated from these activities, though there would be a slight increase in the
46 volume of live-fire activities attributable to this unit stationing. Soils of new firing lanes
47 constructed on existing ranges as part of this scenario would be exposed to lead munitions and
48 soils contamination from live fire activities of these new units.
49

Maneuver Training: CS units stationed under this scenario would participate in small unit (platoon and below) maneuvers at Fort Richardson, AK. These units would support combat units during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at Donnelly Training Area and other USAG Alaska maneuver areas. Engineer and military police units under this stationing scenario would be anticipated to execute about 25-30 percent of their maneuver training at Fort Richardson as small units and the remainder during large-scale maneuver training rotations within the boundaries of USAG Alaska training areas. The total increase in maneuver impact would not be anticipated to be more than 10-20% over what currently takes place on Fort Richardson's small unit maneuver training areas. While CS units are supporting combat units and executing small unit maneuvers, both on and off-road maneuver would be required. In some events, shallow excavation activities may also be required as part of standard operations.

Scenario 3: Growth by 3,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Fort Richardson. Growth by 3,000 additional Soldiers would increase the current Soldier population by more than 50%. In addition, this increase would be accompanied by a large increase in the family dependent population of Fort Richardson, which would also increase by more than 50%. Such an increase would drive requirements to expand the cantonment area outside the current footprint of the Fort Richardson cantonment area. Facilities could not be sited in the current cantonment area and power, sewage lines, water lines and roads would need to be extended to the expansion location for the new cantonment area. This area would consist of between 100-150 acres of land outside of the existing cantonment area.

Table 4.7-3 listed the space and size requirements for key facilities associated with the growth of 3,000 CSS Soldiers.

Table 4.7-3. Fort Richardson Facilities Requirements for Scenario 3 and 4

Garrison Facilities	Requirement
Fuel Storage (gallons)	90,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	54,000
Company Offices (sf)	300,000
Unit Storage Buildings (sf)	40,000
Barracks Space (sf)	300,000
Military Vehicle Parking (sf)	1,200,000
Vehicle Maintenance Shop (sf)	90,00

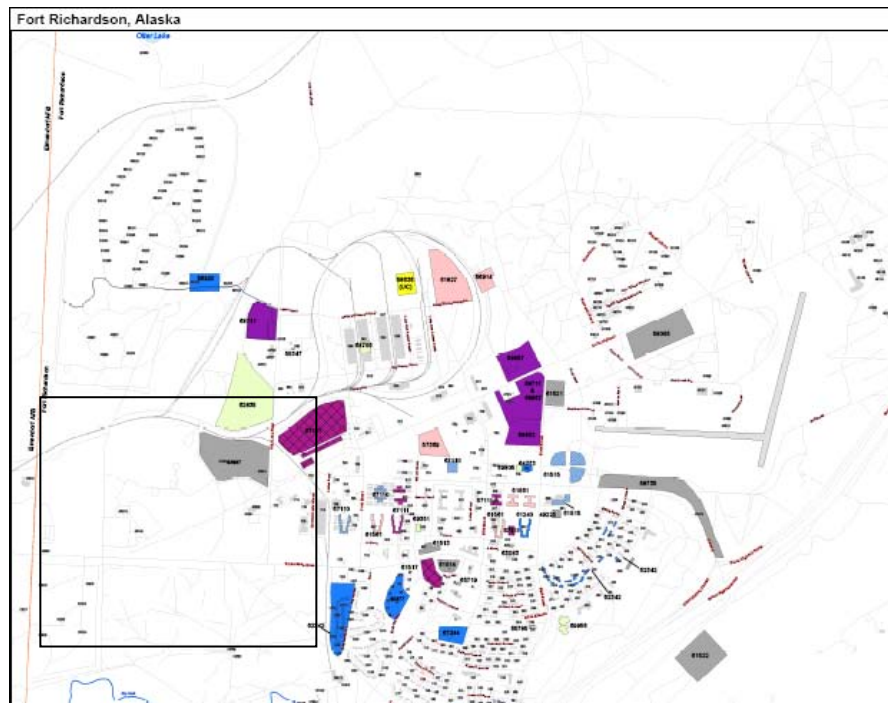


Figure 4.7-2. Construction Location for Additional Cantonment Facilities for Scenario 3-5

Range Construction: To accommodate the stationing of 3,000 new CSS Soldiers, Fort Richardson will need to upgrade training range. Upgrades will be required to meet doctrinal training requirements of 3,000 additional combat support Soldiers. These Soldiers will primarily need to engage in basic marksmanship tasks and qualifications with individual and crew served weapons. As part of this scenario no new ranges would be built but the Modified Record Fire Range, the Known Distance Range, and the Combat Pistol Qualification range would be expanded through the addition of more firing lanes to accommodate a greater number of Soldiers. Each of these ranges would be expanded at the location of the existing ranges which are currently located to the East of the Fort Richardson cantonment area. Figure 4.7-4 depicts the current location of each of the ranges below. The scope of the necessary expansion and purpose of each range is described below:

Modified Record Fire Range (MRF): This range is used to train support unit Soldiers in basic marksmanship tasks. The range teaches Soldiers to quickly aim and engage stationary infantry targets. To implement the proposed action between 8 and 12 lanes would need to be added to this 16 lane range to expand its training capacity.

Known Distance Marksmanship Range (KD Range): This range is used to train Soldiers to identify and engage stationary and moving targets at a known distance. 25 additional lanes would be added to this 25 lane facility to expand the range capacity to a total of 50 firing lanes.

Combat Pistol Qualification Course (CPQC): This combat pistol range is used to train Soldiers to identify, engage, and defeat an array of targets using the 9mm, .38 caliber, or .45 caliber pistol. This project involves the extension of the 7 lane CPQC by 8 additional lanes for an upgraded range totaling 15 lanes to allow more capacity.

Live Fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. Firing activities would be conducted on existing qualification ranges on Fort Richardson. In comparison to the 4/25th IBC and other units stationed at Fort Richardson, 3,000 additional CSS Soldiers would increase existing live fire requirements on qualification ranges by 30-45%. There are no new impacts that would be anticipated from these activities, though there would be a slight increase in the volume of live-fire activities attributable to this unit stationing. Soils of new firing lanes constructed on existing ranges as part of this scenario would be exposed to lead munitions and soils contamination from live fire activities of these new units.

Maneuver Training: CSS units will support the maneuver training exercises of combat units; supporting their logistics and support requirements. Off-trail maneuver by these units would be limited, with major operations consisting of resupply, transport of equipment and command and control functions. A majority of maneuver operations would take place at Donnelly Training Area and other USAG Alaska maneuver areas. Much of this maneuver would occur on existing road and train infrastructure. Additional small unit maneuver support missions at the platoon level would be supported at Fort Richardson's existing maneuver sites. Off-road travel would be minimal and significant off-road maneuver requirements are not be anticipated.

Scenario 4: Growth by 3,000 Additional Combat Support Soldiers

Cantonment Construction: Same proposed action as scenario 3.

Range Construction: All range upgrades discussed in Scenario 3 would take place. In addition, the MPMG (machine gun) range would be expanded to accommodate additional firing activities and its length would be extended out to 1500 meters to allow sniper range qualification. Range locations are provided in Figure 4.7-3 below.

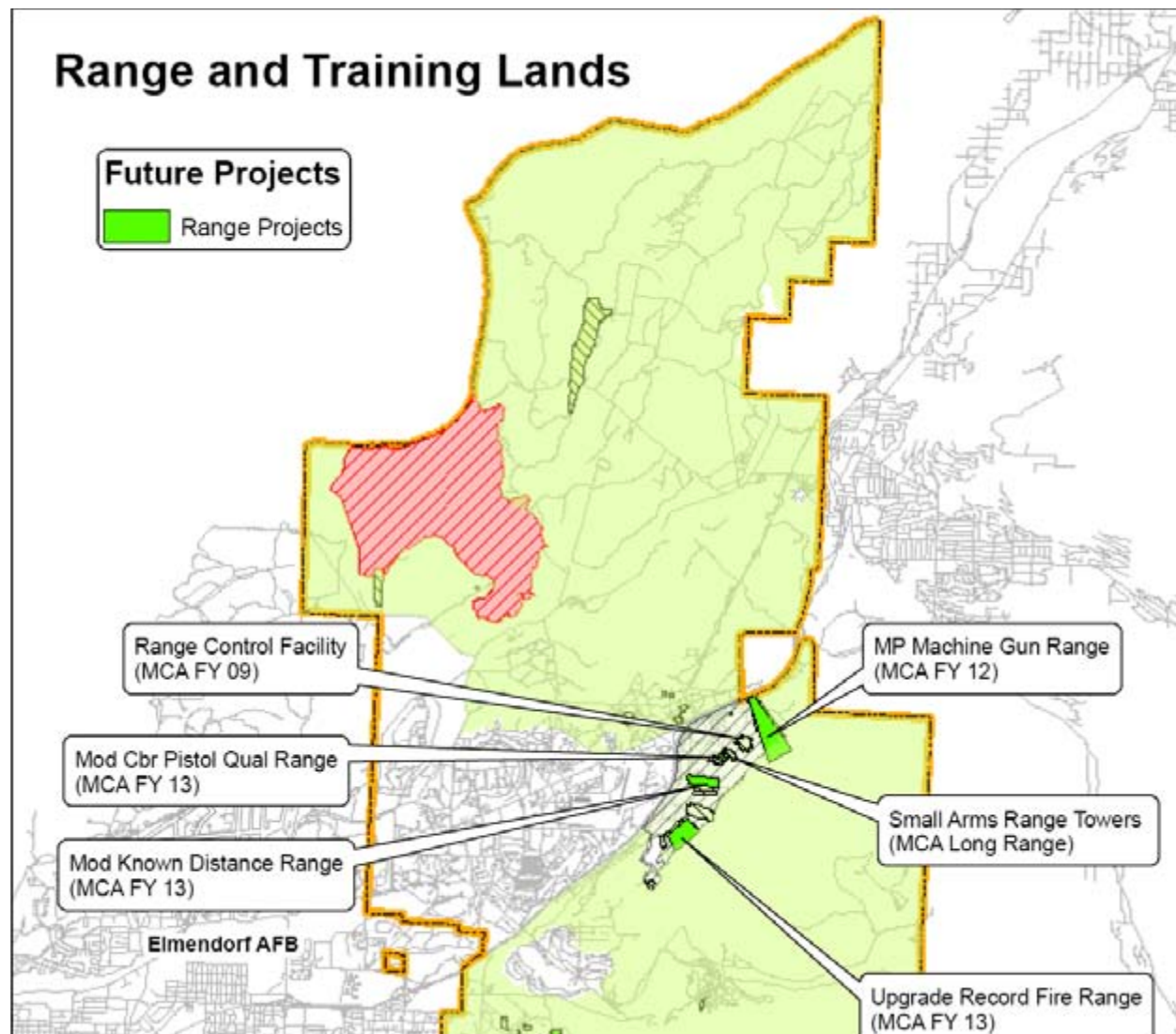


Figure 4.7-3. Proposed Range Upgrade Projects and Existing Range Locations

Live Fire Training: Training activities of CS units would primarily involve many of the same weapons qualifications discussed under scenario 3, with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. CS units would also be required to conduct certifications with MK-19 grenade machine gun systems and also demolitions training and certification in the case of combat engineering units. Firing activities would be conducted on existing qualification ranges and upgraded ranges on Fort Richardson. In comparison to the 4/25th IBCT and other units stationed at Fort Richardson, 3,000 additional CS Soldiers would increase existing live fire requirements on qualification ranges by 45-60%. There are no new impacts that would be anticipated from these activities, though there would be a slight increase in the volume of live-fire activities attributable to this unit stationing. Soils of new firing lanes constructed on existing ranges as part of this scenario would be exposed to lead munitions and soils contamination from live fire activities of these new units.

Maneuver Training: CS units stationed under this scenario would participate in small unit (platoon and below) maneuvers at Fort Richardson, AK. These units would support combat units during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at Donnelly Training Area and other USAG Alaska maneuver areas. Engineer and military police units under this stationing scenario would be anticipated to execute about 25-30 percent of their maneuver training at Fort Richardson as small units and the remainder during large-scale maneuver training rotations within the boundaries of USAG Alaska training areas. The total increase in maneuver impact would be anticipated to be 30-60% over what currently takes place on Fort Richardson's small unit maneuver training areas. While CS units are supporting combat units and executing small unit maneuvers, both on and off-road maneuver would be required. In some events, shallow excavation activities may also be required as part of standard operations.

Scenario 5: Growth by an additional Field Artillery (Fires) Brigade

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on Fort Richardson. The stationing of a Fires Brigade at Fort Richardson would involve the stationing of approximately 1,600 additional Soldiers which would increase the current Soldier population by more than 25%. In addition, this increase would be accompanied by a large increase in the family dependent population of Fort Richardson, which would also increase by more than 25%. Administratively, the units of the Fires Brigade would need to be collocated to effectively coordinate training and command and control of its subordinate units. Such an increase would drive requirements to expand the cantonment area outside the current footprint of the Fort Richardson cantonment area. Facilities could not be sited in the current cantonment area and power, sewage lines, water lines and roads would need to be extended to the expansion location for the new cantonment area. This area would consist of between 75-120 acres of land to the east of the current cantonment area. The footprint would be sited in the same vicinity as depicted by figure 4.7-2 in scenario 3, though the overall cantonment expansion would be slightly more than half the size of what was proposed in scenario 3.

Table 4.7-4 listed the space and size requirements for key facilities associated with the stationing of a new Fires Brigade at Fort Richardson.

Table 4.7-4. Fort Richardson Facilities Requirements for Scenario 5

Garrison Facilities	Requirement
Fuel Storage (gallons)	50,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	36,000
Company Offices (sf)	150,000
Unit Storage Buildings (sf)	20,000
Barracks Space (sf)	150,000
Military Vehicle Parking (sf)	800,000
Vehicle Maintenance Shop (sf)	50,000

Range Construction: All range upgrades discussed in Scenario 3 would take place. In addition, the MPMG (machine gun) range would be expanded to accommodate additional firing

activities and its length would be extended out to 1500 meters to allow sniper range qualification. Range locations are provided in Figure 4.7-4 below.

Live Fire Training: Live fire training activities of the Fires Brigade would primarily involve many of the same small-arms and crew served weapons qualifications discussed under scenario 3, with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns.. Firing activities would be conducted on existing qualification ranges and upgraded ranges on Fort Richardson. In comparison to the 4/25th IBC and other units stationed at Fort Richardson, additional Fires Brigade Soldiers would increase existing live-fire requirements on qualification ranges by 25-40%. There are no new impacts that would be anticipated from small arms qualification and crew served weapons firing activities. Soils of new firing lanes constructed on existing ranges as part of this scenario would be exposed to lead munitions and soils contamination from live fire activities of these new units.

In addition to small arms qualifications, however, units of the Fires Brigade, including a battalion of 155 mm howitzer artillery pieces and Multiple Launch Rocket System (MLRS) Artillery would conduct firing activities into the impact area at Donnelly training area. Firing would take place from dozens of firing points to which artillery units would maneuver before firing into the impact area.

Maneuver Training: Fire Brigade units stationed under this scenario would participate in small unit (platoon and below) maneuvers at Fort Richardson, AK. These units would support combat units during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at Donnelly Training Area and other USAG Alaska maneuver areas. Field artillery units stationed under this stationing scenario would be anticipated to execute about 25-30 percent of their maneuver training at Fort Richardson as small units and the remainder during large-scale maneuver training rotations within the boundaries of USAG Alaska training areas. The total increase in maneuver impact would be anticipated to be 20-40% over what currently takes place on Fort Richardson's small unit maneuver training areas. While Fires Brigade units are supporting combat units and executing small unit maneuvers, both on and off-road maneuver would be required.

4.7.2 Fort Richardson Affected Environment and Environmental Consequences

This section discusses the existing baseline conditions for each environmental resource as well as the anticipated consequences to FRA should the Army implement one of the stationing scenarios discussed in Chapter 4.7.1.

4.7.3 Air Quality

4.7.3.1 Affected Environment

With approximately 6,640 miles of coastline, a significant portion of Alaska is influenced by ocean waters and the seasonal distribution of sea ice. Locations that are under the predominant influence of the sea are characterized by relatively small seasonal temperature variability with high humidity. For the Cook Inlet region, summer temperature averages range from 52.8°F to 56.7°F, with some variability; fall temperatures average 46.4°F to 16.2°F; winter temperatures range from 16.2°F to 24.6°F; and spring ranges from 24.6°F to 45°F. The average annual temperature at Cook Inlet is 34.7°F. The annual precipitation for this region is approximately 24.81 inches (Alaska Climate Research Center Web site, n.d.).

FRA is located near the cities of Anchorage and Eagle River and is adjacent to Elmendorf Air Force Base. Eagle River is situated on the installation's northeast border, whereas Anchorage and Elmendorf AFB forms the western boundary. To the north lies the Knik Army of the Cook Inlet. The geographic features that most influence climate at Fort Richardson are latitude and terrain, and the installation's relative position to waterbodies and landmasses. The St. Elias and Chugach Mountains act as a barrier to the maritime climatic influence (Pacific Ocean) from the south; and a transitional zone to the north. The Alaska Range in the north shelters the installation from arctic air masses from the state's interior region.

While air monitoring stations are present in both Eagle River and Anchorage, no monitoring stations are located on Fort Richardson. Temperature inversions contribute to the degradation of air quality by trapping Carbon Monoxide (CO) close to the ground, sometimes resulting in conditions where Anchorage exceeds the National Ambient Air Quality Standards (NAAQS) CO standard. Table 4.7-5 lists NAAQS.

Table 4.7-5. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide (CO)	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾		
Lead (Pb)	1.5 ug/m ³	Quarterly Average	Same as Primary	
Nitrogen Dioxide (NO ₂)	0.053 ppm (100 ug/m ³)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM ₁₀)	150 ug/m ³	24-hour ⁽²⁾	Same as Primary	
Particulate Matter (PM _{2.5})	15.0 ug/m ³	Annual ⁽³⁾ (Arithmetic Mean)	Same as Primary	
	35 ug/m ³	24-hour ⁽⁴⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁵⁾	Same as Primary	

Table 4.7-5. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
(O ₃)	0.08 ppm (1997 std)	8-hour ⁽⁶⁾	Same as Primary	
	0.12 ppm	1-hour ⁽⁷⁾ (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide (SO ₂)	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 ug/m ³)	3-hour
	0.14 ppm	24-hour ⁽¹⁾		

⁽¹⁾ Not to be exceeded more than once per year.

⁽²⁾ Not to be exceeded more than once per year on average over 3 years.

⁽³⁾ To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁽⁴⁾ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

⁽⁵⁾ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

⁽⁶⁾ (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

⁽⁷⁾ (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

The City of Anchorage is among the top 10 worst air quality regions in the western U.S. Anchorage is classified as a serious maintenance area for CO (as of March 12, 2008), and the Eagle River area is in nonattainment for PM₁₀. While Fort Richardson is not within either nonattainment area, both criteria pollutants contribute to the primary issues of regional concern in which Fort Richardson resides. The primary source of CO emissions from Anchorage is motor vehicles (approximately 83.6 percent), which are believed to be the result of engine “cold starts” during the winter months. Additional data on CO pollution for the region is found in the Transformation Environmental Impact Statement, U.S. Army Alaska (U.S. Army, 2004).

PM₁₀ issues associated with the town of Eagle River is due largely to (more than 90 percent) travel on unpaved roads. 10 percent of fugitive dust/emissions are attributable to automobile exhaust, wood stove burning, and industrial sources. While these sources have contributed to high PM₁₀ in the past, the state has implemented measures to minimize impacts which resulted in no PM₁₀ exceedances since 1987.

FRA is currently in attainment with all criteria air pollutants. The installation is a major source of criteria air pollutants and has the potential to emit approximately 250 tons of at least one criteria air pollutant. Fort Richardson currently has a Title V permit issued in November 2003 and set to expire in December 2008. The installation is currently undergoing a Minor Source Permit revision to desegregate sources and to be removed as a Title V facility. An application has been submitted by the installation to the Alaska Department of Environmental Conservation (ADEC) and therefore must comply with several NESHAPs for hazardous air pollutants and source categories; and also must comply with 40 CFR 60.116b for fuel tanks. The installation has also pursued an Alaska State Air Quality Control Plan to install 523 small boilers and water heaters, which all future buildings constructed must include. Compliance with the Air Quality Control Plan must also be monitored as part of the installation's Title V Permit Application. The Title V Permit Application also lists 16 significant sources and several insignificant sources of air pollution in the emissions inventory section.

All prescribed burning activities on the installation are in compliance with its prescribed burn plan and are coordinated with the Bureau of Land Management (BLM).

4.7.3.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Impacts from either of these stationing scenarios would include dust and opacity issues from new construction and the remodel or demolition of existing. As construction of new COFs, Headquarters buildings, motor pool, and other facilities would occur as infill among the existing cantonment area, additional dust control measures would be necessary.

There would be an increase in mobile source emissions from construction vehicles. Impacts to air quality however, would be temporary, lasting the duration of the facilities construction. Vehicle emissions and fugitive dust generated by heavy construction equipment and materials transport may have short-term impacts which are anticipated to be less than significant.

The additional fleet vehicles and Soldier POVs would have more long-term effects. While Fort Richardson itself is in attainment for all criteria air pollutants, an increase of mobile source emissions on the installation may cause air quality impacts to nearby Anchorage, which is in a nonattainment area for CO.

FRA utilizes decentralized central heating and cooling. The installation uses more than 523 separate small boilers and water heaters in its existing buildings. The construction of new buildings would require the use of small boilers and water heaters as well. The addition of 1,000 Soldiers would increase the emissions given off by small boiler systems. FRA may need to apply for a Minor Source Title I permit for small heaters and boilers. However, because the installation resides in an attainment area for all criteria pollutants, conformity analysis may not be necessary. There would be an increase in some criteria pollutants such as nitrogen oxides (NO_x), however these emissions are expected to remain under the installation's 40 tons/year limit for PSD.

Training Range Infrastructure Construction. Short-term effects would occur. Construction vehicles would cause soil disturbance that may generate fugitive dust leading to additional air quality impacts. Fugitive emissions and dust generated from expansion of ranges would affect

the areas adjacent to ranges, but by and large would be contained within the range area. Best management practices would be used to mitigate fugitive dust emissions during construction.

Live-fire Training. Localized emissions from the increase in live-fire from small arms firing may be anticipated. The weapons associated with new unit stationing are the same weapons systems as are currently being fired on the installation by its tenant units. The frequency of live-fire activities on facilities designated for live-fire use would increase by less than 20 percent. The emissions released into the environment from live-fire training would result from the use of hand-held weapons such as rifles; crew served weapons such as machine guns; and (in the case of CS units, explosive munitions. Rifles and Machine Guns have very low emissions rates; and these emissions are generally dispersed quickly (depending on wind speed and direction) (Driver et al, 1993). 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 (www.epa.gov/ttn/chief/ap42/ch15/index.html, n.d.).

Live-fire activities may also increase the risk of wildfires, which may create short-term adverse impacts to air quality. Fires can add Carbon Monoxide (CO), Particulate Matter (PM₁₀ and PM_{2.5}), and Polycyclic Aromatic Hydrocarbons (PAH), among other combustion byproducts. In addition, the smog created from fires can travel great distances and potentially impact on-post housing and off-post communities.

Maneuver Training. Smaller unit maneuvers would continue to be supported at FRA, while Company-level and above would be supported at Donnelly Training Area (DTA) and other Alaska training sites. Vehicles associated with CSS or CSS 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 Ozone (O₃).

In addition, CS 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 increase opacity and fugitive dust within the range area.

Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than Significant).

Impacts from each of these scenarios would include dust and opacity issues from new construction.

The installation is currently undergoing a Minor Source Permit revision and is being removed as a Title V major air pollutant contributing facility. All stationary source groupings have the capacity to grow currently; although insignificant sources may need to be listed under a Title V permit application.

Cantonment Construction. To accommodate this level of growth, the installation may consider the use of modular facilities until cantonment construction is complete. Historically, the use of these facilities has caused the temporary increase in emissions due to the use of small boilers or heating units. A Title I permit may be required prior to construction; however there is no anticipated need for a conformity analysis.

Impacts from these stationing scenarios would include dust and opacity issues from new construction. Because the Soldier population would increase by 25 – 50 percent, construction of new facilities to the west of the cantonment area (Figure 4.X-X) would encompass a large area and resulting in an increase in fugitive dust.

There would be an increase in mobile source emissions from construction vehicles. Impacts to air quality however, would be temporary, lasting the duration of the facilities construction. Vehicle emissions and fugitive dust generated by heavy construction equipment and materials transport.

The additional fleet vehicles and Soldier POVs would have more long-term effects. While Fort Richardson itself is in attainment for all criteria air pollutants, an increase of mobile source emissions on the installation may cause air quality impacts to nearby Anchorage, which is in a nonattainment area for CO.

FRA has transitioned away from its centralized heating system to a decentralized system comprised of 523 small boilers and water heaters. An additional 1,000 Soldiers would require new buildings and additional small boiler systems to heat those buildings, thereby increasing emissions. FRA may need to apply for a Minor Source Title I permit for small heaters and boilers. However, because the installation resides in an attainment area for all criteria pollutants, conformity analysis may not be necessary. There would be an increase in some criteria pollutants such as nitrogen oxides (NO_x), however these emissions are expected to remain under the installation's 40 tons/year limit for PSD.

Live-fire Training. Similar to the 1,000 Soldier stationing scenario, temporary localized emissions would occur from the increase in live-fire from small arms. Emissions occur at the firing point, and in the case of MK-19 (used by CS units) would also occur from explosion upon impact. However, approximately 99.8 percent of munitions emissions are consumed during combustion the effects are anticipated to be less than significant. Similarly, rifles and Machine Guns have very low emissions rates and these emissions are generally dispersed quickly (depending on wind speed and direction) (Driver et al, 1993). These emissions are found at the EPA's Technology Transfer network Clearinghouse for Inventories & Emissions Factors, AP42, Fifth Edition, Volume I (www.epa.gov/ttn/chief/ap42/ch15/index.html, n.d.).

Live-fire activities may also increase the risk of wildfires, which may create short-term adverse impacts to air quality. Fires can add CO, PM₁₀ and PM_{2.5}, and PAHs, among other combustion byproducts. In addition, the smog created from fires can travel great distances and potentially impact on-post housing and off-post communities.

Maneuver Training. Smaller unit maneuvers would continue to be supported at FRA, while Company-level and above would be supported at DTA and other Alaska training sites. Vehicles associated with CSS or CSS 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 O₃. These levels of Soldier growth would add approximately 25 to 50 percent more vehicle emissions to the installation as a whole.

In addition, CS 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 increase opacity and fugitive dust within the range area.

4.7.4 Airspace

4.7.4.1 Affected Environment

Anchorage International Airport, 15 miles southwest of FRA, is the nearest commercial airport. It is the largest airport in Alaska for both passenger and air cargo operations. More than 30 carriers provide passenger service in the recently renovated airport. It is the largest air cargo handler and transfer site in the United States. There are competing requirements for airspace by both military and commercial or private air traffic surrounding the installation.

Bryant Army Airfield, located adjacent to the cantonment area and the Glenn Highway, has a main, hard-surfaced, north/south runway, which is 3,000 feet in length. It also has a hard-surfaced crosswind runway oriented east/west. Bryant Army Airfield is used primarily by the Alaska Army National Guard as a base for its fixed-wing aircraft and helicopters. Portions of restricted airspace lie over FRA and over the southern tip of Eagle River Flats Impact Area and some of FRA's training areas (USAG Alaska Regulation 350-2, 1998).

Military Deployments from Fort Richardson are accommodated by Elmendorf AFB; which can also support any type of military aircraft, including the C5 Galaxy.

4.7.4.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).

There is no airspace requirements associated with the Combat Support stationing scenario therefore no impacts are expected. Some airspace requirements may exist with the Combat Service Support scenario if a medical units having MEDEVAC service is located at Fort Richardson; however these activities would be few in occurrence and pose no scheduling conflicts with existing activities.

Cantonment Construction. Construction at FRA is not expected to require modifications to controlled or special use airspace. Therefore, no additional affects are expected.

Training Range Infrastructure Construction. The various range expansion projects that would be required to support any of these stationing scenarios (respectively) is not expected to require modifications to controlled or special use airspace. Therefore, no additional affects are expected.

Live-fire Training. The training of any of these scenarios would be similar to current training activities throughout the garrison. Training would generally involve the use of small arms ranges for all stationing scenarios. Under these stationing scenarios no new ranges would be constructed; however, expansion of some ranges may drive the need for modification to controlled firing areas (CFA) above existing ranges. 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.

Additionally, the installation retains approximately 8,000 hours of airspace time per year (Michael Breyers, USAG Alaska Installation Range Manager); currently, however, only

1 approximately 200 of these hours are used on the average which opens up additional public
2 access. The frequency of Soldiers training on live-fire ranges would increase by approximately
3 15 to 60 percent on live-fire training facilities. This would mean that actual airspace use over
4 FRA ranges would increase from approximately 200 hours annually to between 230 and 280
5 hours annually. This would be a relatively small increase in airspace requirements due to live-
6 fire activities.

7
8 Ordnance live-fire training associated with the Fires Brigade would occur at DTA.

9
10 *Maneuver Training.* Maneuver training of these ground-based units will have no effect to
11 airspace at FRA.

12 13 14 15 **4.7.5 Cultural Resources**

16 **4.7.5.1 Affected Environment**

17
18 The Early Holocene traditions of south-central Alaska were similar to those of the interior and
19 may have been derived from them. In the Middle Holocene, there is a poorly represented shift
20 away from terrestrial animals to marine resources. Sites of the Late Holocene represent a
21 Pacific Eskimo adaptation with characteristic pottery and transverse knives (ulus). The Late
22 Prehistoric is characterized by Athabascan material culture including house depressions, cobble
23 spall scrapers, and fire-cracked stone. These archaeological traditions are thought to be
24 associated with Dena'ina Athabascans.

25
26 The earliest known site in the Cook Inlet region dates to no earlier than 8,000 years ago. This
27 site is associated with the Denali Complex. No sites of this era are known on Fort Richardson.
28 The Middle Holocene Era is also poorly represented in the region. Findings of this era at a
29 Beluga Point Site suggest an affiliation with the Ocean Bay Tradition. No sites of this era are
30 known on Fort Richardson. Numerous sites of the Late Holocene Era have been identified in the
31 Cook Inlet region. These sites show an affiliation with the Pacific Eskimo. No sites of this era are
32 known on Fort Richardson. Many late prehistoric Athabascan sites are also known in the region.
33 Most of these sites are believed to be associated with the Dena'ina people who were here when
34 Cook arrived. No sites of this era are known on Fort Richardson.

35
36 Captain Cook searching for the Northwest Passage in 1778 encountered the Dena'ina in Cook
37 Inlet. However, there had been Russian fur traders in the region since early in the century, and
38 there had undoubtedly been earlier, undocumented contacts. The Dena'ina hunted caribou,
39 seal, moose, bear, mountain goat, squirrel, and Dall sheep and harvested salmon. They shared
40 many traits and tools with the neighboring Eskimo. Several Dena'ina villages had been located
41 near Fort Richardson. Historically, the largest village in the area was Knik, near the mouth of the
42 Knik and Matanuska Rivers.

43
44 The U.S. purchased the rights to Alaska from Russia in 1867. Beginning in the 1880s, Anglo-
45 American trappers, miners, and settlers moved into the area, and the influx accelerated after the
46 discovery of gold. The early gold rushes along the coast had little impact on Cook Inlet, but the
47 rushes in the interior had a strong impact. Anchorage grew with the development of the Alaska
48 Railroad beginning in 1913. Anchorage was established as a construction camp and
49 headquarters for the railroad. Anchorage took its name from nearby Knik Anchorage, an
50 important supply center for the interior during the gold rushes. The railroad was completed in
51 1923. During the Great Depression, schools, roads, bridges, trails, harbors, and water systems

were built and developed throughout Alaska. The Old Richardson Highway from Matanuska Valley to Anchorage was built across what is now Fort Richardson in 1935.

Elmendorf Field was established in 1939 and renamed Fort Richardson in 1940. The location was chosen for its comparatively favorable weather and access to the transportation resources of Cook Inlet and the Alaska Railroad. In World War II, Fort Richardson was a coordinating spot for the Alaskan war effort and a strategic location for defending Alaska from invasion. Later in the Cold War, Fort Richardson preformed primarily a training and administrative support role.

At least six archaeological surveys were completed on Fort Richardson between 1970 and 2000. Four of these were small reconnaissance surveys that did not identify any archaeological sites. The cantonment area of Fort Richardson is considered to have a low potential for prehistoric sites. In contrast, six of the Fort Richardson training areas have been identified as having high archaeological sensitivity. A survey of selected sample zones in 1980 identified four historical archaeological sites. Six archaeological sites are known on Fort Richardson, four are historic and one was reported as both prehistoric and historic. Later reports list the last site as prehistoric. All of the sites are recommended as not eligible. Portions of the Seward to Susitna segment of the Iditarod Historic Trail cross Fort Richardson, and may have associated historical archaeological sites. Many areas need to be surveyed and there is a strong potential for newly discovered sites, particularly in those settings identified as having high archaeological sensitivity.

Several areas on Fort Richardson were excluded from the list of areas identified for archaeological inventories in the Integrated Cultural Resources Management Plan (ICRMP) because of mission considerations (including hazards), low site potential, or low potential for mission impact. These areas include:

- The Eagle River Flats impact area, which contains UXO and is off-limits to cultural resource management;
- The Alpine Tundra zone, which is an ecologically sensitive zone protected by limitations on training;
- Wetlands, including freshwater and saltwater marshes, bogs, and lakes that are often covered by standing water and have a low potential for undisturbed archaeological sites. This does not include riparian areas along drainages; and
- Cantonment developed areas that have been extensively disturbed for development and are unlikely to retain undisturbed archaeological sites. Some isolated portions of the cantonment near Ship Creek and Camp Carroll are comparatively undisturbed.

Two historic building surveys have been completed on Fort Richardson for the Nike Site Summit and Cold War era buildings. The Nike Summit Inventory documented 27 contributing buildings and structures. Nike Site Summit has been listed on the NRHP as a historic district. Additional studies of Cold War era historic buildings on Fort Richardson are currently underway. Fifty-four buildings and structures currently exist in the Fort Richardson Historic Area. USAG Alaska developed a Cold War context for Fort Richardson (USAG Alaska 2002). USAG Alaska is currently in the process of evaluating the buildings within the cantonment area to evaluate the potential eligibility of a Cold War historic district. The parcel in question would be comprised of the older facilities located in the center of the cantonment and require close coordination between installation staff and the Alaska SHPO.

1 Consultation with Alaskan Native Tribes to identify Traditional Cultural Properties (TCP's) or
2 other sites of cultural or sacred significance has been on-going. Multiple contracts with Alaskan
3 Native communities are in the process of being executed but currently no TCP's or other cultural
4 resources have been identified.

7 **4.7.5.2 Environmental Consequences**

9 **CSS (1,000), CS (1,000): (Significant but Mitigable).**

11 *Cantonment Construction.* Construction to accommodate an additional 1,000 Soldiers would
12 occur as infill (de-construction/construction or modification of new or existing structures among
13 the cantonment area) in the FRA cantonment area. Construction can cause direct damage to
14 these resources from the operation of heavy equipment or during demolition of nearby facilities;
15 or may have indirect impacts from vibration. The Alaska State Historic Preservation Office
16 (SHPO) is in the process of determining the presence of a Historic District within the
17 cantonment area. The parcel in question is small and is located at the center of the cantonment
18 area. Any construction in the vicinity of this historic district would require close coordination
19 between installation staff and the SHPO. FRA staff is currently negotiating a programmatic
20 agreement for addressing maintenance and repair of historic resources in the cantonment area,
21 and routinely continues consultation with the SHPO.

23 *Training Range Infrastructure Construction.* Modification and expansion of ranges would occur
24 under these stationing scenarios. Construction equipment would involve grading/re-grading site
25 surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface. These
26 activities have the potential to result in damage to cultural resources; or potentially destroy,
27 damage, or restrict access to properties of traditional importance resulting in adverse effects.
28 As indicated above, Fort Richardson training areas have been identified as having high
29 archaeological sensitivity. Although the areas where range expansion would occur are in highly
30 disturbed areas (within or nearby the footprint of existing ranges) additional archaeological
31 surveys or Section 106 consultation may be needed.

33 *Live-fire Training.* Range expansion and new targetry would be sited to avoid cultural resources
34 at FRA following identification of these sites during cultural resource surveys. Live-fire activities
35 would not have a significant impact to cultural resources.

37 *Maneuver Training.* Maneuver training may impact cultural resources. Maneuver training is
38 restricted to prevent impacts to known cultural resources sites. No new maneuver areas would
39 be required to support these stationing scenarios. Maneuver training under all scenarios would
40 be conducted in the footprint of existing ranges and trails at FRA. However, new cultural
41 resources currently not identified could be impacted through maneuver training discussed in
42 these scenarios. Stationing scenarios involving CS units, particularly engineer or combat
43 engineer units, may involve some surface excavation, which could potentially uncover or
44 damage undocumented cultural resources.

47 **Fires Brigade (1,600), CSS (3,000), CS (3,000): (Significant but Mitigable).**

49 *Cantonment Construction.* Construction would occur in an area approximately 75 to 150 acres
50 in size (depending on the stationing scenario) to the east of the existing cantonment area.
51 Construction can cause direct damage to these resources from the operation of heavy

equipment or during demolition of nearby facilities; or may have indirect impacts from vibration. Although the cantonment area of Fort Richardson is considered to have a low potential for prehistoric sites, the alternative construction site may not have been previously surveyed for these or other cultural resources. Cultural resource surveys would need to be accomplished prior to project siting.

The Alaska SHPO is in the process of determining the presence of a Historic District within the cantonment area. The parcel in question is small is located at the center of the cantonment area. However, because construction would take place a safe distance away from the potential Historic District, the probability of damage from construction is dramatically reduced. FRA staff is currently negotiating a programmatic agreement for addressing maintenance and repair of historic resources in the cantonment area, and routinely continues consultation with the SHPO.

Training Range Infrastructure Construction. Modification and expansion of ranges would occur under these stationing scenarios. Construction equipment would involve grading/re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface. These activities have the potential to result in damage to cultural resources; or potentially destroy, damage, or restrict access to properties of traditional importance resulting in adverse effects. As indicated above, Fort Richardson training areas have been identified as having high archaeological sensitivity. Although the areas where range expansion would occur are in highly disturbed areas (within or nearby the footprint of existing ranges) additional archaeological surveys or Section 106 consultation may be needed.

Live-fire Training. Range expansion and new targetry would be sited to avoid cultural resources at FRA following identification of these sites during cultural resource surveys. Live-fire activities would not have a significant impact to cultural resources.

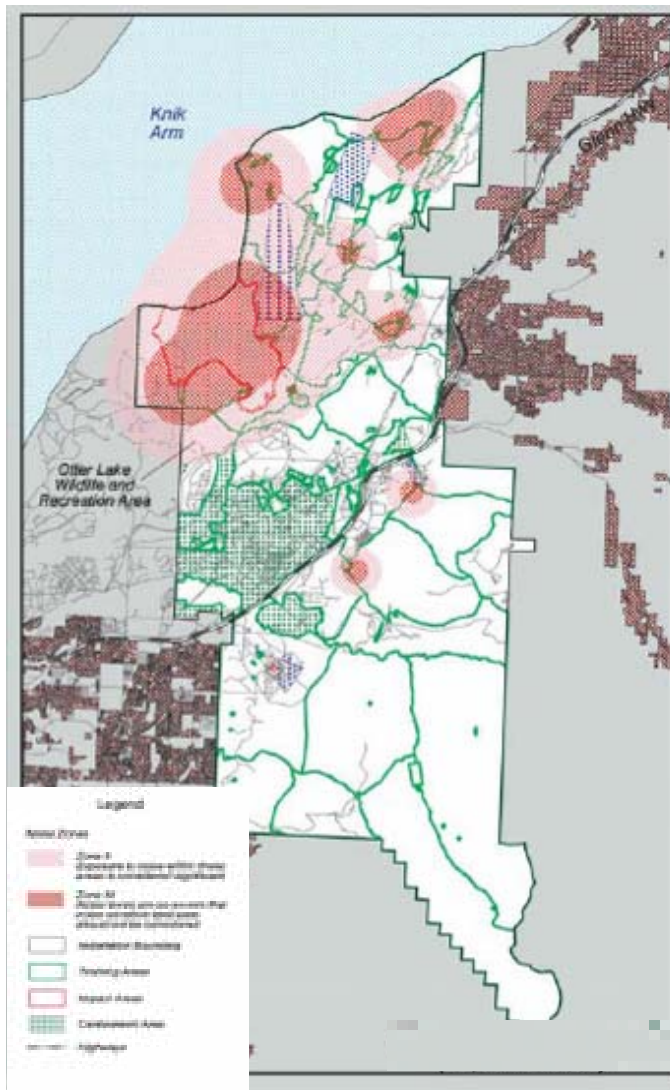
Maneuver Training. Maneuver training may impact cultural resources. Maneuver training is restricted to prevent impacts to known cultural resources sites. No new maneuver areas would be required to support these stationing scenarios. Maneuver training under all scenarios would be conducted in the footprint of existing ranges and trails at FRA. However, new cultural resources currently not identified could be impacted through maneuver training discussed in these scenarios. Stationing scenarios involving CS units, particularly engineer or combat engineer units, may involve some surface excavation, which could potentially uncover or damage undocumented cultural resources.

Company- and above-level maneuver would continue to occur at DTA or other USAG Alaska training sites.

4.7.6 Noise

4.7.6.1 Affected Environment

The more important sources of noise at Fort Richardson are traffic, live-fire from small and large caliber weapons, and aircraft overflights. These elements are documented in greater detail in the Installation Environmental Noise Management Plan (IENMP). Noise contours associated with large and small caliber weapons are contained within military lands at both Fort Richardson and Elmendorf AFB. Noise contours associated with Noise Zones II and III overlap a portion of the ocean near Eagle River Flats. However, Fort Richardson receives a few noise complaints



from the public each year; these are generally due to helicopter overflights (Robert Hall, USAG Alaska Public Affairs Officer).

In response to these few complaints the installation has adopted the use of quieter equipment and has rescheduled aircraft training times to reduce the impact to the public. Firing activities are scheduled to limit noise impacts to both on-post residents and off-post populations. Most low frequency, high-energy blast events occur at Donnelly Training Area and are removed from receptor populations. Noise at Fort Richardson has the potential to impact recreation, land use, biological resources (wildlife) which in turn can impact subsistence activities. Figure 4.7-4 illustrates the noise contours at FRA. As illustrated, NZ III is contained mostly within the installation boundary, and does not overlap with residential areas. NZ II affects the northern portion of the cantonment area and parts of the Otter Lake Wildlife and Recreation Area.

Figure 4.7-4. Noise contours at FRA

4.7.6.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than Significant).

Cantonment Construction. Impacts from construction for these stationing scenarios would be temporary. Noise associated with range construction would result from the movement of construction vehicles and equipment. An assessment of specific impacts would be conducted upon final siting of facilities required to support these stationing scenarios. Construction for the 1,000 soldier stationing scenarios may have more of an impact to cantonment activities than would construction supporting more than 1,000 Soldiers. This is due to the proximity of the

1 potential construction site. However, noise from construction to the east of the existing
2 cantonment area could have more noise effects to wildlife currently inhabiting this area.

3
4 Noise associated with construction equipment generally produce noise levels of 80 to 90 dBA at
5 a distance of 50 feet. Permissible noise exposures identified by the Occupational Safety and
6 Health Administration (OSHA) (29 CFR 1910.95) for an 8-hour work day is 90 dBA. Therefore
7 construction noise in the cantonment area would likely be compliant with these levels. The zone
8 of relatively high construction noise may extend to distances of 400 to 800 feet from major
9 equipment operations; and those locations that are more than 1,000 feet from construction sites
10 generally do not experience significant noise levels. There are no communities within 1,000 feet
11 from the cantonment area at FRA; therefore noise from construction activities is not anticipated
12 to be significant.

13
14 *Training Range Infrastructure Construction.* Similar to cantonment construction, range
15 construction would result from the movement of construction vehicles and equipment. There
16 are not effects anticipated to the public due to potential range expansion locations; however,
17 temporary noise impacts may occur to wildlife. This would be discussed in Chapter 4.7.6
18 Biological Resources.

19
20 *Live-fire Training.* Although the same intensity of noise would continue, stationing 1,000 or
21 more Soldiers would increase the frequency of noise generating events. The frequency of live-
22 fire events that generate noise may increase by 15 to 60 percent depending on the stationing
23 scenario. As ranges are expanded to accommodate these additional Soldiers the noise
24 contours around these ranges may expand as well. However, due to their location in the central
25 portion of the post, no increased impacts to the public are anticipated. There may be some
26 expected noise effects to wildlife; this would be discussed in Chapter 4.7.6 Biological
27 Resources.

28
29 The fires brigade would train with artillery and ordnance at DTA.

30
31 *Maneuver Training.* Although there would be an increase in Soldiers maneuvering in these
32 areas, the type of noise would be consistent with ongoing maneuver activities. The increased
33 frequency of noise generating events would correspond to the increased maneuvers associated
34 with these stationing scenarios (10 to 60 percent).

35
36 Noise levels along on-post roadways and along military vehicle trails would increase. However,
37 overall traffic volumes and vehicle speeds generally are low for these types of roadways. As a
38 result, noise increments attributable to vehicle traffic would remain within the Army's land use
39 compatibility guidelines.

40
41 The noise effects that would be produced from convoy travel on public roads (when traveling
42 between FRA and central Alaska maneuver sites) would be short-term as these activities are
43 intermittent and are usually mitigated through standard operating procedures for convoy
44 maneuver. A convoy is normally defined as six or more military vehicles moving simultaneously
45 from one point to another under a single commander, ten or more vehicles per hour going to the
46 same destination over the same route, or any one vehicle requiring a special haul permit.
47 Convoys normally maintain a gap of 15 to 30 minutes between serials (a group of military
48 vehicles moving together), 330 feet between vehicles on highways, and 7.5 to 15 feet while in
49 town traffic. These procedures are followed to minimize the noise and traffic impacts to the
50 public.

4.7.7 Soil Erosion

4.7.7.1 Affected Environment

The FRA lies in the Cook Inlet–Susitna Lowland and Kenai–Chugach Mountains physiographic provinces on an alluvial plain called the Anchorage Lowland. The Anchorage Lowland is fed by the Chugach Mountains to the east and flows into to the Cook Inlet to the north, south, and west. The topography of the Anchorage Lowland has been primarily influenced by glacial activity and alluvial deposition and erosion by the four major drainages that originate in the Chugach Mountains – Ship Creek, Eagle River, Campbell Creek, and Chester Creek. The Anchorage Lowland is a triangular area located between the Knik and Turnagain Arms below 500 feet amsl in elevation. It is characterized by rolling hills with topographic relief ranging from 50 to 250 feet. To the east, rolling uplands extend to elevations up to 3,000 feet amsl at the base of the Chugach Mountains. A small portion of the western section of the Chugach Mountains, which rise abruptly to more than 5,000 feet above mean sea level (amsl) on the front, is contained within the FRA boundaries. The peaks of the Chugach Mountains are separated by northwest-trending, steep U-shaped valleys, which are occupied by the four major drainages mentioned above. The Anchorage Lowland is characterized by rolling hills with up to 250 feet of topographic relief in the eastern portion along the Chugach Mountains. The terrain flattens to the west into an alluvial plain that is inundated with broad, shallow streams and wetlands. The FRA contains many landforms that are characteristic of glaciated terrain, including moraines, esker deposits, outwash plains, and estuarine sediments.

Fort Richardson is covered by Quaternary age glacial, glacio-marine (estuarine), and glacio-alluvial sedimentary deposits, with bedrock outcrops occurring in the south and east along the Chugach Mountains. The deposits form a westward-thickening wedge beginning at the base of the Chugach Mountains to a thickness of approximately 656 feet locally. Based on well logs, the thickness of sediments below the cantonment ranges from 230 to 322 feet (Cederstrom et al.1964). Because the glacial sediments underlying Fort Richardson were deposited during multiple ice advances, the stratigraphy is complex, particularly under the cantonment, where sediments deposited along the south margin of Elmendorf Moraine interfinger with alluvial fan sands and gravels. The most common and spatially extensive deposits are end, lateral, and ground moraines; glacio-alluvial, alluvial, and alluvial fan deposits; and estuarine and lacustrine deposits. Loess (wind-deposited silt), colluvium (poorly sorted and uncompacted sand and gravel), and rock glaciers are less abundant in the high mountain valleys.

Parent material that formed the various soil types on Fort Richardson varies widely and includes glacial moraines, glacial outwash, tidal flats, and peat bogs. These soils are shallow, recently formed, nutrient deficient, and have low water-holding capacity, which are all factors that limit vegetative growth during dry periods and limit the potential to reclaim land after surface disturbance. Surface soil horizons may be covered with peat in areas containing depressions, wetlands, and other saturated areas. The NRCS soil survey of the Anchorage area (Moore 2002) identifies two distinct climate zones and associated soil types for FRA: the lowlands surrounding Anchorage, and the neighboring Chugach Mountains.

Along the coast and tidal plains, the Cook Inlet sediments are silty and clayey, with broad depressions in the area occupied by poorly drained bogs and fens. The soils on the lowland plains inland from the coast have less developed horizons because of lower precipitation, mid-winter thaws, and strong localized winds, with the exception of wind-protected forested areas. The uplands at the base of the Chugach Mountains are covered by a layer of silty loess, which

1 is formed by deposition of fine glacial sediments from the floodplains and volcanic ash. The
2 portion of the FRA that encompasses the Chugach Mountains contains soils that were formed
3 because of weathering and leaching of minerals, which was influenced by high annual
4 precipitation, deep snowfall, strong localized winds, and deep annual frost (USAG Alaska 2004).
5 Permafrost is present on less than 1 percent of Fort Richardson, occurring primarily in patches
6 of forested bogs along Muldoon Road as well as in the higher elevations of the areas within the
7 Chugach Mountains. The effects of thermokarst, described above as irregular subsidence of
8 permafrost that causes mounds, hummocks, water-filled depressions, flooded forests, and
9 mudflows on steeper slopes, have been less than 0.1 percent in the last 200 to 300 years in the
10 FRA.

11
12 Sedimentation is an issue that potentially affects Beluga whale populations. The effects of
13 increased soil loading in the water column may decrease the effectiveness of Beluga whale
14 feeding behavior on salmon and the survivorship of whale populations. This issue continues to
15 be researched and investigated.

16
17 USAGAK conserves and manages soil resources as the foundation of other natural resources,
18 through planning level soil and topographical surveys, soil resource monitoring, and soil
19 resources rehabilitation and management strategies. The Draft Natural Resources Guidance
20 from Army Chief of Staff for Installation Management (U.S. Army 2007) requires the installation
21 to identify and map soils, correlate soils to permafrost areas, and establish relationships among
22 components of terrain. The data from these efforts are required for input into the military training
23 and scheduling process. Army Regulations require 10-year updates of topographical planning
24 level surveys to implement the INRMP, as mandated by the Sikes Act.

25
26 Soil monitoring is conducted through the Range and Training Land Assessment Program, which
27 is the monitoring component of ITAM. Annual Range and Training Land Assessment reports
28 detail the levels of current and past disturbance and land condition resulting from military
29 training and recreational use on Fort Richardson. Soil resources management on Fort
30 Richardson is achieved through prevention activities and actual restoration of disturbed areas
31 by implementing BMPs in agreement with industry standard installation storm water prevention
32 techniques. Disturbed areas are restored by both erosion control and streambank stabilization
33 activities, which control installation sources of dust, runoff, silt, and erosion debris to prevent
34 damage to land, water, and air resources; equipment; and facilities (including those on adjacent
35 properties). Relevant BMPs used at Fort Richardson are detailed in the INRMP (USAG Alaska
36 2007) and in the ITAM Five Year Management Plan (USAG Alaska 2005).

37 38 39 **4.7.7.2 Environmental Consequences**

40
41 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than**
42 **Significant).**

43
44 *Cantonment Construction.* Short-term effects may occur from construction. Construction
45 supporting the 1,000 Soldier stationing scenarios would be as infill among existing structures
46 within the main cantonment area where stormwater management practices may already be in
47 place to mitigate potential adverse effects from sediment runoff.

48
49 Construction activities to accommodate growth of more than 1,000 Soldiers to the east of the
50 cantonment area would occur on land that has not recently been disturbed. Although this area
51 currently supports an antennae field, the lack of traffic and human activity in that area has done

1 little to disturb soils there. The use of heavy equipment would remove vegetation and disturb
2 and compact soil in the construction area, making it difficult to support the growth of natural
3 vegetation while increasing the potential for soil erosion. Direct and indirect short-term impacts
4 to vegetation and nearby waterbodies from site runoff may occur. Fugitive dust may also occur,
5 however impacts from dust would likely to be localized and not have any lasting adverse effects
6 to nearby waterbodies. Stormwater runoff from construction sites is mitigable through the
7 installation's existing monitoring activities and best management practices.

8
9 Long-term effects could occur from the compaction of soils, reducing the likelihood for
10 vegetation to re-establish itself and increasing the effects from wind erosion or precipitation.
11 Soils transported away from the construction area may accumulate in gullies or to other areas
12 where post-precipitation event water may carry sediments to other waterbodies.

13
14 *Training Range Infrastructure Construction.* Similar to cantonment construction, training range
15 expansion activities would have temporary direct and indirect effects to soils. The use of heavy
16 equipment would remove vegetation and disturb and compact soil in the construction area,
17 making it difficult to support the growth of natural vegetation while increasing the potential for
18 soil erosion. Direct and indirect short-term impacts to vegetation and nearby waterbodies from
19 site runoff may occur. Fugitive dust may also occur, however impacts from dust would likely to
20 be localized and not have any lasting adverse effects to nearby waterbodies. Increased
21 turbidity and sediment loading on surface waters as a result of construction activities may
22 impact salmon populations and could have indirect effects on Beluga whale populations. Site-
23 specific planning would identify detailed range siting and soil erosion issues. Stormwater runoff
24 from range sites is mitigable through the installation's existing monitoring activities and best
25 management practices.

26
27 *Live-fire Training.* Weapons firing can typically involve the disturbance of soils, denuding the
28 soil surface of vegetation and increasing the erodibility of soils. While weapons firing would
29 typically occur in existing training areas the frequency of the training events would increase and
30 potentially cause a greater amount of soil disturbance, resulting in larger areas of bare ground
31 than what is observed under current conditions. The installation's ITAM program would
32 continue to implement BMPs and mitigation measures that would minimize the erosive effects
33 from live-fire activities to soils.

34
35 For CS and field artillery units, the use of ordnance (small ordnance items such as the MK-19
36 Grenade Machine Gun; larger ordnance items associated with field artillery would be supported
37 at DTA) items or explosives could cause wildfires resulting in the removal of large areas of
38 vegetation that normally protects soil from erosion by slowing surface runoff, intercepting
39 raindrops before they reach the soil surface, and anchoring the soil with roots. Without surface
40 vegetation the top layer of soils may be transported away due to natural processes, and the soil
41 remaining may become compacted leaving little opportunity for vegetation (especially native
42 vegetation) to re-establish itself. Vegetation removal resulting from wildland fires could result in
43 increased soil erosion by water and wind, indirectly causing large-scale removal and
44 redeposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. The
45 impact would be directly proportional to the size of the fire. Wildfire plays an important role in
46 Alaskan ecosystems and is considered a beneficial impact on the natural environment.
47 However, fire starts generated by military training activities often occur in elevated numbers and
48 intervals, thereby causing unacceptable damage to critical vegetative cover that aids in
49 stabilizing soils from wind and water erosion. Fuel maps were created indicating concentrations
50 of fire-prone vegetation and areas recommended for hazard fuel reduction projects; these may
51 be found in the 2004 USAG Alaska Transformation EIS.

Maneuver Training. There would be a 10 to 60 percent increase in maneuver required to support these Soldier stationing scenarios. The increase in maneuver frequency is expected to damage or remove 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 gully, and indirectly to downstream sedimentation, particularly when the vehicles travel off-road.

During summer months, there is a great deal more open or standing water located on FRA. 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 bodies. Training maneuvers in Alaska are often conducted more frequently in the winter months to reduce impacts from soil erosion and to waterbodies.

4.7.8 Biological Resources

4.7.8.1 Affected Environment

Fish & Wildlife

Wildlife is abundant throughout FRA and its surrounding areas, which include a variety of large mammals; small mammals and furbearers; amphibians; fish; and avian species including game birds, waterfowl, passerines, and raptors.

FRA is home to a number of Priority species of conservation importance. Priority species are listed due to their conservation vulnerability. These species include many avian, mammalian, and other species of concern. Priority wildlife species at FRA include the Wolverine, Grizzly bear, Black bear, Wolf, Dall sheep, Moose, Beluga whale (proposed species), and the Common loon, as well as waterfowl and raptor species. Appendix F of the Transformation EIS (USAG Alaska, 2004) discusses these species and human impacts to these species in greater detail.

In addition, the list of priority species includes migratory bird species; these include the Western wood-pewee, Steller's jay, American dipper, Golden-crowned kinglet, and the Golden-crowned sparrow (Partners in Flight). Table 4.7-6 below lists the species of concern found on FRA and DTA (USAG Alaska 2007, 2008). As a note, the Beluga whale is a proposed species and is anticipated to be federally-listed as an endangered species this year. Many activities stemming from the city of Anchorage, surrounding communities, and from FRA and Elmendorf AFB may directly and indirectly affect the Beluga. While the effects of disturbance to the whale are not well understood, the Beluga may be susceptible to shipping, aircraft overflights, and water quality degradation (including any water quality impacts that may affect the salmon that the Beluga whale feeds upon).

Table 4.7-6. Species of Concern found on U.S. Army Alaska lands

Training Area/ Installation	Group	Species	Scientific Name
Fort Richard son	Bird	American peregrine falcon*	<i>Falco peregrinus anatum</i>
	Bird	Northern goshawk (southeast population)	<i>Accipiter gentiles laingi</i>
	Bird	Olive-sided flycatcher**	<i>Contopus cooperi</i>

	Bird	Gray-cheeked thrush	<i>Catharus minimus</i>
	Bird	Townsend's warbler	<i>Dendroica townsendii</i>
	Bird	Surfbird	<i>Aphriza virgata</i>
	Bird	Rusty Blackbird	<i>Euphagus carolinus</i>
	Bird	Blackpoll warbler	<i>Dendroica striata</i>
	Amphibian	Wood Frog	<i>Rana sylvatica</i>
	Mammal	Brown bear (Kenai Peninsula population)	<i>Ursus arctos horribilis</i>
	Mammal	Harbor seal	<i>Phoca vitulina</i>
	Mammal	Beluga whale (Cook Inlet Population)	<i>Delphinapterus leucas</i>
Species of Management Concern	Moose Caribou Bison Chinook salmon Wolverine Lynx Dall Sheep Black Bear Brown Bear Wolf Sharp-tailed Grouse Ruffed Grouse Grayling		

* Downlisted from the Alaska Endangered Species List

** Category 2 Candidate Species under Federal Endangered Species Act

Recreational Hunting and Fishing and Subsistence Hunting

Wildlife and fisheries management on USAG Alaska lands has traditionally supported recreational and subsistence use, maintenance of populations and habitats, and preservation of biological diversity. Wildlife and fish populations and their habitats are managed cooperatively by USAG Alaska, the Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service. More information on wildlife and fisheries can be found in the Transformation of U.S. Army Alaska Final Environmental Impact Statement (USAG Alaska 2004).

Fort Richardson is located within the Alaska Department of Fish and Game's Game Management Unit 14 and Game Management Subunit 14C. A detailed map of Game Management Subunit 14C and the wildlife species available for hunting (and their associated seasons and regulated hunting limits) is found in the Alaska Department of Fish & Game's 2007-2008 Alaska Hunting Regulations, No. 48 (Regulated by Title 5, Alaska Administrative Code and Title 16 of Alaska Statutes) (www.wildlife.alaska.gov, n.d.).

Fish stocking is a common activity at four lakes on Fort Richardson and is intended to promote the recreational use of Army lands while improving the health of rainbow trout (*Oncorhynchus mykiss*), chinook salmon (*Oncorhynchus tshawytscha*), and arctic char (*Salvelinus alpinus*) populations. Waters within the installation also support wild populations of the silver salmon (*Oncorhynchus kisutch*), chum salmon, red salmon (*Oncorhynchus nerka*), pink salmon (*Oncorhynchus gorbuscha*), the dolly varden (*Salvelinus malma*), and the three-spine stickleback (*Gasterosteus aculeatus*).

1
2 FRA is located within the traditional lands of the Dena'ina, northern Athabascan Tribes of Cook
3 Inlet. The Dena'ina traditionally pursued a semi-permanent lifestyle, spending winters in
4 permanent settlements and dispersing in the summer months with the onset of summer fish
5 runs. Seasonal camps at favorable fishing locations were established along riverbanks, coastal
6 edges, and lakeshores. A number of these traditional fish campsites are known to lie within what
7 is now FRA. Once salmon runs had ended, groups would often travel into the mountains to hunt
8 caribou and mountain sheep. Moose, bear, mountain goats, and Dall sheep were often hunted
9 year-round in areas outlying winter village settlements.

10
11 The only Dena'ina village remaining in the FRA vicinity is the Native Village of Eklutna, located
12 approximately 10 miles north of the cantonment area and post entrance. However, the Native
13 Village of Knik and many other communities from further up Knik Arm traditionally traveled to
14 the Anchorage area with the June king salmon runs. It is known that many communities in the
15 Cook Inlet region traditionally used a wide variety of subsistence resources that are present
16 today on FRA. Contemporary communities extend through kinship ties into Eagle River and
17 Anchorage, for example. Any reference to specific communities here is based on current
18 proximity of federally recognized tribal governments to USAG Alaska managed lands. It is
19 hoped that a better understanding of subsistence use and traditional use areas on FRA will be
20 gained through ongoing coordination efforts.

21 22 23 **Vegetation**

24
25 Vegetation type and distribution is generally influenced by climate, topography, soil types,
26 hydrology and other factors; and in Alaska vegetation types are broadly classified as barren
27 lands, tundra, forest land, and scrub land, and wetland. Four plant species are ranked in USAG
28 Alaska's short list of species of concern for ecosystem management; these are *Carex*
29 *sychnocephala*, *Phlox hoodii*, *Carex parryana*, and *Sisyrinchium montanum*, which are rare and
30 considered critically imperiled within the state of Alaska. A more detailed description of
31 vegetation types is found in Robert G. Bailey's Description of Ecoregions of the United States
32 (U.S. Department of Agriculture, 1995). USAG Alaska conducted extensive studies and surveys
33 of its land assets from 1998 to 2000. Detailed maps and classifications of vegetation relative to
34 USAG Alaska's land assets are found in Jorgenson et al. (1999, 2001, 2002). According to
35 Jorgenson et al. (2002), of the 61,972 acre post commanded by Fort Richardson, 55.3 percent
36 is covered by forest, 23.7 percent by scrub land, human disturbed lands comprise 13.1 percent,
37 5.5 percent are barren lands, bog and wetland make up only 1.6 percent (this conflicts with the
38 8% in the wetlands section), 0.7 percent is meadow, and 0.5 percent of Fort Richardson is
39 water. The Transformation Environmental Impact Statement, U.S. Army Alaska (USAG Alaska,
40 2004) offers a more comprehensive discussion of vegetative cover throughout the installation.
41 Fort Richardson's INRMP describes the installation's forest management program.

42 43 44 **Wildfire Management**

45
46 Fire management on USAG Alaska installations is required by the Sikes Act and by Army
47 regulation. Fire management plans are required by the Resource Management Plan, which is
48 mandated under Public Law 106-65, the Military Lands Withdrawal Act. Additional direction
49 regarding fire management is stated in a 1995 Memorandum of Understanding between the
50 Bureau of Land Management (BLM) and USAG Alaska as well as in the Army wildland fire
51 policy guidance document (U.S. Army 2002). Wildland fire management in Alaska requires

1 multi-agency cooperation. Fire management is a joint effort by USAG Alaska and the BLM,
2 Alaska Fire Service (AFS). The agencies have developed two inter-service support agreements,
3 which establish the AFS's responsibility for all fire detection and suppression on installation
4 lands (AFS and USAG Alaska 1995a,b). In exchange, the Army provides the AFS with use of
5 certain buildings, utilities, land, training services, air support, and other support services.
6

7 The AFS also has a Reciprocal Fire Management Agreement with the State of Alaska's
8 Department of Natural Resources, Division of Forestry (AFS and State of Alaska 1998). Under
9 this agreement, the agencies have implemented a coordinated fire suppression effort and have
10 identified areas where each agency has agreed to provide wildland fire suppression, regardless
11 of whether the lands are under state or federal ownership.
12

13 The Alaska Wildland Fire Management Plan, which is reviewed each year, designated wildland
14 fire management areas and allowed land managers to establish fire management options
15 according to land use objectives and constraints. The Alaska Wildland Fire Management Plan
16 also established four fire management options: Critical, Full, Modified, and Limited (USAG
17 Alaska 2004). Land managers may select among these options for different parcels of land
18 based on evaluation of legal mandates, policies, regulations, resource management objectives,
19 and local conditions (Alaska Wildland Fire Coordinating Group 1998). In addition, two additional
20 fire management option categories have been developed specifically for lands managed by
21 USAG Alaska. Unplanned Areas are not officially designated but receive fire management equal
22 to the Full management option. The AFS has responsibility for initial response in Unplanned
23 Areas (USAG Alaska 1999b). Restricted Areas or Hot Zones include impact areas and other
24 locations where no "on the ground" firefighting can be accomplished due to danger of
25 unexploded ordnance. High-hazard impact areas are managed as Hot Zones with Limited
26 management.
27

28 The north post of FRA is classified for Full and Critical fire management options due the high
29 value of resources at risk from fire, in addition to the post's proximity to Anchorage, Eagle River,
30 and Elmendorf AFB (Alaska Wildland Fire Coordinating Group 1998). Most of the north post is
31 classified for Critical fire management. The training areas along Knik Arm are classified for Full
32 fire management. Many military resources at north post are at risk from wildland fire. Cultural
33 resources staff identified sites in the north post area, and management options related to
34 wildland fire have been developed. Cultural resources potentially at risk from wildfire have also
35 been identified in DTA East and Main Fort Greely Post, and management options related to
36 wildland fire have been determined. The north post is bounded by Elmendorf AFB, private
37 parcels, railroad lands, and Native Corporation lands (USAG Alaska 2002b).
38

39 The south post has areas classified under Critical, Full, and Limited fire management. Most of
40 the south post is under Full fire management because the area is mainly used for military
41 training and small arms ranges. The alpine zones are classified for Limited fire management
42 because of their remote location. Many military resources are at risk from wildland fire in the
43 training areas of the south post, including two small arms complexes. Additional surveys are
44 needed to ascertain sites where ordnance has been used and disposed. Cultural resources staff
45 identified sites in the south post area, and management options related to wildfire have been
46 determined. The south post is bound by private parcels and state lands (USAG Alaska 2002b).
47

48 Although wildfires are a concern at FRA, they are rarely a significant problem. Numerous fires
49 have been recorded in the Matanuska-Susitna Valley to the north, but no major fires have
50 occurred on FRA since 1950 (Jorgenson et al. 2002). Severe drought conditions occur about

once every 20 years, and, in normal years, there is an average of less than five wildfires. These fires are usually mission-related, small, and easily contained.

The FRA Fire Department provides the initial response for wildfire suppression, which has traditionally been confined to areas behind the small arms complex. Because of the extensive mortality of white spruce in the area, fire prevention activities were conducted in 1999 and 2000 to reduce fuel loads adjacent to the small arms ranges (USAG Alaska 2002b). When necessary, BLM reimburses the Alaska Division of Forestry to suppress wildfires in the southern half of the state, including FRA. The Division of Forestry also provides training for wildfire suppression at FRA. USAG Alaska and Elmendorf AFB have a mutual aid agreement for fire suppression (USAG Alaska 2002b).

There is some concern over the spruce bark beetle that killed most of the larger white spruce in the north and south post training areas. The dead spruce has resulted in high fuel load conditions on the forest floor. Additionally, the deaths of the larger spruce trees have allowed areas to be taken over by bluejoint reedgrass, another potential fire risk (USAG Alaska 2002b). The absence of wildfires may be inhibiting the potential for optimal ecosystem development. The current infestation of spruce bark beetles in old-aged timber is one problem that may have been exacerbated by a lack of wildfires (USAG Alaska 2002b). To reduce this threat, 60 acres of dead spruce were removed along the Stuckagain Heights residential area, and 10 acres of dead spruce were removed near another housing area. Additionally, Grezelka Range was recently treated with a 15-acre prescribed burn to reduce fuel loads.

4.7.8.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Significant but Mitigable).

Cantonment Construction. Short-term impacts to wildlife from construction noise are expected, but may have greater effects from scenarios supporting more than 1,000 Soldiers. Construction supporting the 1,000 Soldier stationing scenario would occur as infill among the existing cantonment area. This area is built up and is not currently supporting any sensitive wildlife species.

Construction occurring in the antennae field to the east may have more significant effects to vegetation and wildlife. Construction and the use of heavy equipment would disturb soils and remove vegetation and soil compaction from heavy equipment may make it difficult for soils to support the future growth of natural vegetation. Stormwater runoff from the construction site(s) may result in short-term adverse impacts to nearby waterbodies, increasing turbidity and temporarily degrading water quality and potentially impacting the fish and invertebrates that live and feed in those waters; and indirectly effecting the terrestrial, avian, and marine mammals (such as the Beluga whale) that feed on fish like the Salmon that use these waterways. Impacts to waterways would be temporary and localized, and the installation would ensure BMPs are in place to minimize and mitigate potential impacts from runoff. The installation has a robust and successful stormwater management program.

Construction activities (increase in vehicles and human presence) create noise and disturbs habitat. While these activities have not been shown to be detrimental to hunting and foraging behavior or reproductive success, these effects may vary by location, species, and type of human activity (Bowles (1993), Holthuijzen et al. (1990), and Doresky et al. (2001)).

Construction impact to soils could make soils available for invasive plant species to become established. 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 Alaska lands. The Range and Training Land Assessment program monitors vegetation and documents invasive plant species. These species are managed using integrated pest management techniques, whereby chemical control is minimized.

Adverse impacts to species of concern would include increased habitat loss and disturbance; however, the proposed alternatives are unlikely to cause such impacts as proposed projects would occur in previously developed or disturbed areas. USAG Alaska's policies for management of endangered species are outlined in the Integrated Natural Resources Management Plan (USAG Alaska 2007). USAG Alaska monitors and manages its species of concern. The focus of installation natural resource management is at the ecosystem level. These management goals and objectives include protection and conservation of species of concern found on USAG Alaska posts, identification and delineation of species and their habitats, and compliance with Section 7 of the Endangered Species Act. If species are listed as threatened or endangered USAG Alaska would consult with U.S. Fish and Wildlife Service and conduct planning as part of its natural resources management program. The USAG Alaska natural resources management program implements inventory and monitoring to identify the location and distribution of any rare, uncommon, or priority species; and protects habitats of these species.

Training Range Infrastructure Construction. Short-term impacts from construction noise are expected, however (as discussed above) these activities have not shown to have significant long-term impacts to wildlife behaviors or reproductive success. Movement of equipment into areas that do not currently support military activities would increase the likelihood of nonnative plant and animal introductions. Construction equipment and materials can introduce invasive species and other weeds to the area which may affect the long-term habitat of some wildlife. Since range renovations and construction would occur on previously disturbed soils at FRA, the effects to general wildlife and habitats are anticipated to be less than significant.

Although there are no threatened and endangered species found on the installation, past experience with range construction has demonstrated that construction activities may temporarily inhibit Moose from grazing in some range areas. However, installation staff have observed the return of Moose after construction projects. It is thought that Moose and other ungulates may be attracted by the growth of herbaceous, non-woody vegetation which are prevalent on Army ranges in Alaska.

Live-fire Training. Operation of ranges has the potential to displace various wildlife species. Displacement would be caused by increased human presence in the area, as well as by elevated noise levels. Wildlife species that are more tolerant of human activity may remain in or around these ranges. Individuals that remain within the impact area and associated surface danger zones could be directly affected by munitions. Higher training levels at existing ranges would increase incidental mortality to wildlife. However, such mortality is not expected to cause measurable impacts to wildlife populations.

Direct impacts to wildlife from noise associated with live-fire activities would be long-term but are not anticipated to be significant. If food is abundant on or near the ranges where Soldiers fire weapons and maneuver wildlife species tend to adjust to training activities. Bowles (1990) found that predator species will often move toward the sound of gunfire because the

disturbance of prey species (seeking shelter) may provide successful hunting opportunities. This was supported in a raptor study conducted by Andersen et al. (1986, 1990), and a study conducted by the Fish and Wildlife Service in 1988 regarding training noise impacts to northern harriers. Although Bowles suggested that other studies indicated large mammals may move away from military training sites, they will often return during times when the ranges are not in use.

Impacts from live-fire activities would include the disturbance of soils and vegetation on ranges, increasing the erodibility of soils and requiring more monitoring and maintenance. The use of explosives by CS units may create craters and remove vegetation. The explosives residue associated with their use is not expected to migrate easily off-range due to low precipitation and near year-round frozen conditions.

Live-fire training could potentially increase the frequency of wildfires. A larger number of Soldiers would use existing or expanded ranges for live-fire training. As a result of more rounds being fired there would be an increased risk of accidental wildfire ignition. Sources of wildfire ignition would include small arms fire, vehicles, flammable materials, and cigarettes. Several fire mitigation measures are being implemented throughout the garrison on existing ranges and would be in place under all stationing scenarios. Reclassification of fire management options may occur to ensure fire management meets anticipated changes in wildfire risk. Prescribed burns of deadfall timber would continue to ensure reduced levels of fuel loading in range areas. In drought years fire management practices would be adjusted. Given relatively low frequency of wildfires at FRA and its ongoing fire management activities, the impacts are anticipated to be mitigable to less than significant.

Maneuver Training. Additional Soldiers associated with these scenarios would significantly increase the amount of maneuver on ranges (by approximately 10 to 60 percent). Although these units would stay mostly on roads and hardened surfaces possible disturbances to soils in off-road training areas may erode away vegetation and further compact soils making it more difficult for vegetation to re-establish itself. Potential direct impacts include damage to soil surface and causing disruption to the permafrost layer below, allowing soils to subside and creating the opportunity for water to collect at the surface. Any impacts to permafrost may considerably alter the landscape and habitat in range areas.

CS units would have a greater degree of impact on vegetation and wildlife communities due to the increased frequency from off-road maneuver and ground clearance activities. The noise associated with CS and CSS maneuver activities would be of the same intensity as currently experienced, however, more maneuver rotations would occur at FRA.

4.7.9 Wetlands

4.7.9.1 Affected Environment

Almost half of the immense state is classified as wetlands, which make the wetland important to Alaska's economy, ecology, and culture. Wetland types found there are saltwater or brackish (tidal flats and estuaries), and freshwater further divided into marshes, bogs, and fens. A more detailed description of wetlands is found in Robert G. Bailey's Description of Ecoregions of the United States (U.S. Department of Agriculture, 1995).

At Fort Richardson, nearly 4,990 acres of land (or approximately 8 percent) is classified as wetlands and include marine and freshwater, tidal and non-tidal types. The largest of these resources is Eagle River Flats at 2,165 acres; which is now listed on the EPA's National Priorities List for cleanup of hazardous substances. Although the hazardous material found there, mainly white phosphorus, was determined to have little to no impact on most wildlife species that live or forage for food there, water birds were determined to be at serious risk, especially shorebirds, dabbling ducks, and swans. In a step to preserve that important resource, USAG Alaska ceased the use of white phosphorus there in 1989, and munitions items containing the chemical constituent were banned from impact areas throughout Alaska in 1991. Remediation efforts are ongoing at Eagle River Flats.

Nearly 8 percent of the land at FRA is covered by wetlands. The following are the most prevalent types of wetlands there.

Wetland Type	Totaling ~8% of FRA Land	Wetland Characterization and/or Location	Vegetation
Coastal Halophytic Zone	3%	Shoreline tidal flats and barren mud flats	Rye grass, Lyngebye sedge, Maritime arrow grass, Glasswort, Goose tongue, and Alkali grass
Lowland Forest Wetlands	3%	Eagle River Flats (2,165 acre estuarine marsh) Palustrine	Bluejoint grass, Oak fern, Red raspberry, Lowbrush cranberry, Red currant, shrubs, and sedges
Lacustrine Wetlands	1%	Bordering Ship Creek, McVeigh Marsh, Fossil Creek Bottomlands; areas southwest of Eagle River Flats; and south and west of Clunie Lake. Open water and vegetated with sedges	Marsh Five-finger, Marsh and Woodland horsetail, Cahmiss's cottongrass, Shore sedge, and Sphagnum moss
Alpine and Subalpine Wetlands	0.3%	Sub-alpine areas of FRA	Bluejoint meadow wetlands

4.7.9.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (No Impact).

Cantonment Construction. Because there are no wetlands present in the cantonment area no impacts are expected.

Training Range Infrastructure Construction. Small pockets of wetlands exist in the training areas of FRA. During springtime, it has been historically difficult to differentiate between wetlands and temporary standing water from snowmelt; both can appear hydrologically similar without further investigation. The installation takes precaution if siting a range and may likely consider a wetlands delineation or further evaluation if uncertain. Site-specific analysis would determine if range siting would impact wetlands, but installation staff would avoid wetlands when siting range expansion projects.

1 *Live-fire Training.* As stated above, the installation would site ranges and their firing points
2 away from documented wetland areas to avoid potential impacts wherever possible. The live-
3 fire activities are not anticipated to change the function or presence of wetlands at FRA. The
4 presence of munitions constituents may occur in some wetlands areas on designated firing
5 ranges.

6
7 *Maneuver Training.* Maneuver from these stationing scenarios is expected to remain on roads
8 and hardened surfaces, within the existing road and trail network at FRA. No additional roads
9 or trails would likely be constructed and therefore only minor impacts to nearby wetlands from
10 runoff are anticipated. Site-specific analysis would identify range roads and trails that these
11 units may use to train, their proximity to wetlands, and potential impacts.

12 13 14 15 **4.7.10 Water Resources**

16 **4.7.10.1 Affected Environment**

17 18 Watershed

19
20 Major waterways on each of the Army's installations and training lands in Alaska are classified
21 as either glacial or non-glacial. Each variety of waterway experiences higher flow conditions
22 during spring and summer, whereas water flow is reduced (low flow) during the fall and winter
23 seasons. Non-glacial waterways will experience a sharper increase in flow during May
24 coinciding with snowmelt; and glacial waterways tend to experience peak discharge in June or
25 July, coinciding with melting of glaciers.

26
27 The State of Alaska has assigned freshwater use classes to its waters, protecting them from
28 exceedances for certain uses; these are Class (A) Water Supply, (B) Water Recreation, and (C)
29 Growth and propagation of fish, shellfish, other aquatic life, and other wildlife. If exceedances in
30 water quality standards are detected the state will designate that waterbody as "water quality
31 limited".

32
33 FRA is located within the Cook Inlet watershed which for FRA consists of two major waterways
34 and several smaller tributaries. At FRA, the main glacial waterway is Eagle River, originating at
35 the base of the Eagle Glacier in the Chugach Mountains. Eagle River flows through FRA and
36 settles out at Eagle River Flats, the estuarine tidal marsh located at the mouth of the river. Ship
37 Creek (a non-glacial waterway) flows from Ship Lake at the Chugach Mountains to the Knik Arm
38 where water is diverted to FRA and Elmendorf AFB (USAG Alaska, 2004) (discussed below).
39 Smaller tributaries include Chester Creek (located south of Ship Creek) which flows through the
40 southwestern portion of FRA and into a marsh wetland at the base of the Chugach Mountains
41 and then is re-channeled near FRA's western border. North Fork Campbell Creek is a non-
42 glacial stream that stems from Long Lake (in the Chugach Mountains) and flows across FRA's
43 southwestern corner where waterflow there recharges the groundwater aquifer. McVeigh Creek
44 also begins near the Chugach Mountains and flows west to southwest (parallel to Glenn
45 Highway) and flows through FRA's small arms range where it continues to McVeigh Marsh and
46 drains into Ship Creek upstream from the Glenn Highway Bridge. Snowhawk Creek (also non-
47 glacial) is a tributary to Ship Creek; it drains Tanaina Lake and flows northeast through
48 Snowhawk Valley and joins Ship Creek upstream of Ship Creek Dam and Reservoir. Clunie
49 Creek flows from wetlands located south of Clunie Lake into Eagle River Flats and ultimately
50 drains into Knik Arm. Finally, Otter Creek is a perennial stream that flows from Otter Lake to
51 Eagle River Flats.

1
2 FRA has 12 lakes and several unnamed waterbodies totaling approximately 359 acres. Five of
3 these lakes are managed for recreational fishing.
4

5 Water quality at FRA is indicated by different classes of freshwater use as assigned by the
6 Alaska Department of Environmental Conservation (ADEC); these are not discussed in this
7 document. However, ADEC has labeled Eagle River Flats as a Tier II waterbody and Ship
8 Creek a Tier I waterbody based on the degrees in which they exceed water quality standards.
9 Eagle River Flats contains white phosphorus contamination due to previous military activities.
10 Ship Creek is water quality limited due mainly to non-point source pollutants entering the
11 waterbody downstream of FRA.
12

13 Water Supply

14
15 As indicated above, all of FRA's water supply is diverted from the reservoir at Ship Creek. The
16 Army has primary rights to 7 MGD, and nearly 10 MGD is diverted from the reservoir to the
17 Anchorage Water and Wastewater Utility (AWWU). The water supply is treated and distributed
18 throughout FRA. The installation currently uses an average of 1 to 1.5 MGD even though it is
19 permitted for much more. However, the water treatment plant is only capable of processing 6
20 MGD. Flow rate and water treatment at the plant can be influenced by avalanches or increased
21 turbidity from rain events. The soils hosting the water distribution system tend to be favorable to
22 protecting from water pipe bursts during earthquakes. While pipes bursting may have been a
23 problem some time ago, the entire system was upgraded in the late 1980s to a stronger system
24 that is not prone to earthquake activity. The distribution system on-post is gravity fed through
25 and in some locations is augmented with booster pumps due to low flow.
26

27 If peak capacity is exceeded, or if an alternate source of water is necessary, FRA also maintains
28 the ability to access water from the Eklutna line through a 36 inch distribution pipe. However,
29 because this line has only been tested once and is not well-monitored for maintenance needs,
30 there are potential problems with distribution and access.
31

32 Additionally, the installation may also use well network systems (3 wells) situated near the
33 hospital (which one) that have the capability of pumping up to 1,000 GMP. This system is
34 sometimes used when spring water flow into Ship Creek is low.
35

36 The water treatment and wastewater treatment systems at FRA is undergoing privatization,
37 soon to be transferred to Doyon Utilities, which would also assume control of maintenance for
38 the distribution system throughout post.
39

40 Wastewater

41
42 There are no wastewater treatment facilities at Fort Richardson (Doyon Utilities Web Site, n.d.).
43 There is one main line leaving post that carries wastewater from FRA. Historically, the
44 wastewater treatment plant (City-owned) can handle a maximum capacity waste stream from
45 FRA and Elmendorf AFB of 3.5 to 4.0 MGD (Elmendorf accounts for approximately 60 percent
46 of the waste stream). However, due to recent upgrades the treatment plant may be able to
47 accommodate up to 6.0 MGD. Doyon Utilities is currently conducting a characterization study to
48 determine the need for upgrades and maintenance on current distribution and receiving
49 pathways.
50

51 Stormwater

FRA has an intensive stormwater program and conducts strict enforcement of BMPs to ensure against stormwater runoff from the installation. Furthermore, the installation has recently invested in a full-time stormwater monitor dedicated to stormwater compliance throughout the installation 7 days per week, offering a greater degree of quality assurance and control at all construction sites.

4.7.10.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Construction within the main cantonment area would require the tie-in of utilities to the existing infrastructure. There is more than adequate water supply and infrastructure to accommodate any of these stationing scenarios, especially as construction may be infilled among existing structures and centrally located in the cantonment area. The wastewater collection and water distribution system may require some upgrades. This would consist of the new design of filters in the wastewater treatment plant and additional piping in the water distribution system. The remainder of the water distribution infrastructure at FRA should be adequate to meet demand.

Construction 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. Impacts from construction runoff are expected to be temporary. The installation's stormwater monitoring and compliance program could manage additional stormwater runoff. Any construction that disturbs more than one acre of land would require a stormwater pollution prevention plan (SWPPP). A SWPPP would prescribe measures that the installation would implement to channel stormwater and decrease turbidity and sedimentation. Construction BMPs such as sediment/silt fences would be used to ensure no sediment tracks off or flows off construction sites.

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, and an SWPPP to address leaks or spills of hazardous materials. With these established measures, impacts are expected to be less than significant.

Training Range Infrastructure Construction. Construction impacts in the range area would be similar to construction impacts in the cantonment area. During ground preparation for range expansion, grading, excavating, and trenching may expose erodible soils to stormwater runoff and increase the potential for sediments to migrate to surface waters. These potential impacts would be reduced to acceptable levels by implementing standard construction BMPs. Impacts from construction runoff are expected to be temporary. The installation's stormwater monitoring and compliance program is prepared to handle additional capacity.

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, and an SWPPP to address leaks or spills of hazardous materials. With these established measures, impacts are expected to be less than significant.

1 *Live-fire Training.* There would be an increase of less than 20 percent in live-fire training on
2 existing and expanded ranges. The increase in weapons qualification training would increase
3 lead and other materials on ranges. A greater amount of runoff from impacted berms and
4 exposed soils is possible. The installation's ITAM program monitors impacts from live-fire
5 activities and would continue to institute the required mitigations and BMPs (such as berm
6 revegetation and regrading) to minimize effects off the firing ranges. Other chemical pollutants,
7 such as petroleum hydrocarbon fuels or lubricants, may be indirect effects resulting from
8 vehicles parked at the training sites. Overall impacts are expected to be less than significant
9 given the limited increase in live-fire activities on ranges designed for weapons qualification at
10 FRA.

11
12 There may be a small increase in the risk of wildland fires due to the increase in Soldiers using
13 these ranges. Wildland fires can generate chemical contaminants, and loss of vegetation can
14 increase the potential for soil erosion and sediment loading to streams resulting in impacts to
15 water quality.

16
17 *Maneuver Training.* Additional traffic on the range road network and stream crossings during
18 maneuver may contribute to increased sedimentation and turbidity in waterbodies. Efforts may
19 be considered to reinforce stream crossings and ice bridge approaches and monitor those areas
20 for decreased water quality. Further, bivouac sites in the training area may also need
21 monitoring and maintenance to ensure against stormwater runoff that may stem from the effects
22 of increased Soldier throughput in those areas.

23
24 Increased maneuver training would increase the use of fuels, solvents, and other hazardous
25 and toxic substances, which might result in indirect impacts to surface and/or groundwater if
26 accidentally released into the environment. However, implementing BMPs including SPCC
27 would minimize potential impacts resulting from leaks or spills of hazardous materials. Impacts
28 are expected to be less than significant.

29
30
31 **Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than Significant).**

32
33 *Cantonment Construction.* There is more than adequate water supply to accommodate these
34 stationing scenarios. However the stationing of more than 1,000 Soldiers would require
35 construction in an area to the east of the cantonment area. As there is currently no
36 infrastructure there, Doyon (privatized utilities provider) would need to add new water
37 distribution and collection lines and make slight upgrades to the wastewater collection system.
38 The results of Doyon's water system characterization study should determine the need for
39 additional capacity if the proposed action were to be implemented at FRA. Further power and
40 telecommunication systems would need to be constructed to this area. The wastewater
41 treatment plant may not currently have adequate capacity to accommodate this level of growth;
42 however, upgrades would be relatively simple and would consist of the addition of new filters in
43 the wastewater treatment plant

44
45 Construction activities could affect surface water by localized increases in erosion and runoff.
46 Potential impacts would include increased overland flow and runoff and decreased percolation
47 to groundwater. Impacts from construction runoff are expected to be temporary. The
48 installation's stormwater monitoring and compliance program could manage additional
49 stormwater runoff. Any construction that disturbs more than one acre of land would require a
50 stormwater pollution prevention plan (SWPPP). A SWPPP would prescribe measures that the
51 installation would implement to channel stormwater and decrease turbidity and sedimentation.

1 Construction BMPs such as sediment/silt fences would be used to ensure no sediment tracks
2 off or flows off construction sites.

3
4 Operation of construction vehicles could cause spills of POLs and other hazardous and toxic
5 substances, which could result in indirect impacts to surface and/or groundwater if accidentally
6 released into the environment. The Army has implemented BMPs, an SPCC, and an SWPPP to
7 address leaks or spills of hazardous materials. With these established measures, impacts are
8 expected to be less than significant.

9
10 *Training Range Infrastructure Construction.* Construction impacts in the range area would be
11 similar to construction impacts in the cantonment area. During ground preparation for range
12 expansion, grading, excavating, and trenching may expose erodible soils to stormwater runoff
13 and increase the potential for sediments to migrate to surface waters. These potential impacts
14 would be reduced to acceptable levels by implementing standard construction BMPs. Impacts
15 from construction runoff are expected to be temporary. The installation's stormwater monitoring
16 and compliance program is prepared to handle additional capacity.

17
18 Operation of construction vehicles could cause spills of POLs and other hazardous and toxic
19 substances, which could result in indirect impacts to surface and/or groundwater if accidentally
20 released into the environment. The Army has implemented BMPs, an SPCC, and an SWPPP to
21 address leaks or spills of hazardous materials. With these established measures, impacts are
22 expected to be less than significant.

23
24 *Live-fire Training.* There would be an increase of less than 60 percent in live-fire training on
25 existing and expanded ranges. The increase in weapons qualification training would increase
26 lead and other materials on ranges. A greater amount of runoff from impacted berms and
27 exposed soils is possible. The installation's ITAM program monitors impacts from live-fire
28 activities and would continue to institute the required mitigations and BMPs (such as berm
29 revegetation and regrading) to minimize effects off the firing ranges. Other chemical pollutants,
30 such as petroleum hydrocarbon fuels or lubricants, may be indirect effects resulting from
31 vehicles parked at the training sites. Overall impacts are expected to be less than significant
32 given the limited increase in live-fire activities on ranges designed for weapons qualification at
33 FRA.

34
35 The risk of wildfires is expected to remain at about the same level as under existing conditions
36 or slightly higher due to the increase in Soldiers using these ranges. Wildfires can generate
37 chemical contaminants, and loss of vegetation can increase the potential for soil erosion and
38 sediment loading to streams resulting in impacts to water quality.

39
40 *Maneuver Training.* Additional traffic on the range road network and stream crossings during
41 maneuver may contribute to increased sedimentation and turbidity in waterbodies. Efforts may
42 be considered to reinforce stream crossings and ice bride approaches and monitor those areas
43 for decreased water quality. Further, bivouac sites in the training area may also need to be
44 monitored and maintained more closely to ensure against stormwater runoff that may stem from
45 the effects of increased Soldier throughput in those areas.

46
47 Increased maneuver training would increase the use of fuels, solvents, and other hazardous
48 and toxic substances, which might result in indirect impacts to surface and/or groundwater if
49 accidentally released into the environment. However, implementing BMPs including SPCC
50 would minimize potential impacts resulting from leaks or spills of hazardous materials. Impacts
51 are expected to be less than significant.

4.7.11 Facilities

4.7.11.1 Affected Environment

USAG Alaska facilities include housing; community facilities for education and recreation, emergency responders, healthcare, shopping, and banking, among others; installation support facilities including power, heating, and water utilities and their distribution/collection networks; range and training infrastructure used for the research, testing, and training of personnel, equipment, and weapons systems. The total of USAG Alaska's range and training land acreage is listed below in Table 4.7-7. USAG Alaska has multiple corridors to move supplies and units throughout the garrison; these include air, railroad, and a road network that provide accessibility from south central Alaska to the interior of the state. South Central Alaska also utilizes cargo shipments via sea to transport supplies to and from the state.

The quality and condition of Army ranges training lands are managed and monitored as a part of the Army's Sustainable Range Program (SRP) and Ranges and Training Land Program (RTLTP).

Table 4.7-7. Acres of USAG Alaska Range And Training Land Facilities

Installation	Small Arms Ranges	Major Weapons Systems Ranges	Non Live-fire Ranges	Maneuver Training Areas	Total
Fort Richardson	330	2,884	116	51,086	54,416

Transformation Environmental Impact Statement, U.S. Army Alaska (USAG Alaska, 2004).

Housing: In 2007, Fort Richardson and Elmendorf AFB developed a Joint Housing Market Analysis to assess the private sector housing market's potential to accommodate military families through transition to privatization and for the military to achieve the minimum number of authorized housing units from 2007 to 2012 due to BRAC Commission recommendations (BRAC 2005). The growth covered by this market analysis does not include potential growth associated with the proposed action. During this transition period, both FRA and Elmendorf AFB are projecting growth in mission and personnel. The study reviewed housing requirements for both Soldiers with Families and unaccompanied/ bachelor Soldiers. The study concluded that based on current housing inventories there was an overall surplus of family housing units (when combining the available number of housing units for both installations) to accommodate known growth through 2012. Elmendorf AFB had a surplus of approximately 875 housing units, FRA showed a deficit of 615 units, equating to a total available surplus of 260 housing units. When reviewing the requirements for unaccompanied Soldiers, the study identified a total deficit of 798 housing units.

Table 4.7-8. Total military Family housing units requirement covering non-GTA growth through 2012

Component	Elmendorf AFB	Fort Richardson
	HRMA Through 2012	HRMA Through 2012

Authorized Permanent Party	6,625	6,959
Accompanied Personnel	4,264	4,091
Unaccompanied Personnel	2,361	2,868
Accompanied Personnel	4,264	4,091
Military Couples & Army voluntary Separations	277	352
Military Families	3,987	3,739
In Military Housing	423	385
In Private Sector Housing	3,564	3,354
Homeowners	1,636	502
Renters	1,928	2,852
Suitable Rental Market Share	1,204	1,377
Not Allocated Suitable Housing	724	1,475
Military Family Floor Housing Requirement	423	385
Private Sector Shortfall	724	1,475
Total Military Family Housing Requirement	1,147	1,860
Military Family Housing Inventory	2,022	1,245
Deficit/(Surplus)	(875)	615

Table 4.7-9. Total unaccompanied personnel housing requirement covering non-GTA growth through 2012

Component	2012		
	Elmendorf AFB	Fort Richardson	Total
Unaccompanied Personnel	2,361	2,868	5,229
In Military Housing	1,010	2,511	3,521
In Private Sector Housing	1,351	357	1,708
Homeowners	310	-	1,708
Renters	1,041	357	1,398
Suitable Rental Market Share	839	283	1,122
Not Allocated Suitable Housing	202	74	276
Unaccompanied Personnel Floor Housing	1,010	2,511	3,521
Private Sector Shortfall	202	74	276
Total Unaccompanied Personnel Housing Requirement	1,212	2,585	3,797
Unaccompanied Housing Inventory	831	2,168	2,999
Deficit/(Surplus)	381	417	798

Currently, there are seven Family Housing neighborhoods consisting of 1,435 units and 273 acres. These are adjacent by hills and forest to the south and east (respectively), which work as a barrier against most noise and pollution generated from use of Glenn Highway. The installation has begun a revitalization program for a few of these neighborhoods. It should be noted that revitalization and reconstruction efforts have been initiated for much of the barracks and housing (for enlisted unaccompanied personnel).

Community facilities at Fort Richardson include the commissary and Post Exchange, child development center, a movie theater, and a fast food restaurant. Additional facilities support facilities include those that offer gasoline, chapel, and emergency response and a medical facility. The installation is also home to the Fort Richardson National Cemetery. The

cantonment area also has general –purpose storage, cold storage, deployment equipment storage, shipping and receiving, and ammunition storage units.

4.7.11.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant but Mitigable).

Cantonment Construction. There is not currently enough vacant space at FRA to accommodate the addition of 1,000 Soldiers. Construction at the main cantonment area would occur as infill to accommodate these Soldier stationing scenarios; and would include COFs, Motor Pools, Brigade and Battalion Headquarters buildings, additional storage, military and vehicle parking, among other facilities. These facilities would be tied in to existing utilities and infrastructure, but some upgrades to the water distribution and wastewater collection system would be required. Additionally, the wastewater treatment plant would require minor upgrades.

The potential difficulties in providing adequate housing on the installation itself are coupled with a lack of potential new housing sites outside the installation. Fort Richardson is surrounded by park land, Elmendorf AFB, the City of Anchorage, the Town of Eagle River, and assorted private land holdings. Furthermore, Elmendorf AFB is a major competitor for space in the Anchorage area and is currently growing.

According to the Joint Housing Market Analysis cited above, there may be a shortfall in housing units available to accommodate both unaccompanied Soldiers and Soldiers with Families. For the 1,000 Soldier stationing scenarios approximately 450 Soldiers may be accompanied by Families and would exceed the number of available housing units currently projected for the FRA/Elmendorf AFB region. This number may be expanded under the Fires Brigade (1,600 Soldier scenario) and 3,000 Soldier CS or CSS scenarios. The additional housing requirements for both accompanied and unaccompanied Soldiers may need to be absorbed by both the military and surrounding areas.

Training Range Infrastructure Construction. As cited in Chapter 4.7, range expansion would occur at several ranges in order to meet the increase in training needs. Under current conditions, the ranges would not meet Standards in Training Commission (STRAC) requirements or range requirements sited in Training Circular 25-8 (US Army 2006).

Any ranges constructed would provide limited sanitation in the form of self-contained waste collection points that would be emptied on a regular basis.

Live-fire Training. Long-term impacts would be the increase in range use, resulting in the increase of ammunition and the generation of lead and other materials on FRA ranges. Also, there may be an expected increase in demand for utilities with any new ranges.

Maneuver Training. FRA would have an adequate amount of maneuver space to accommodate squad and platoon level training. Anything at Company level training and above would need to occur at DTA. Current institutional programs, such as the ITAM program, would mitigate impacts to training lands. Additionally, the proposed implementation of institutional programs, such as ITAM, INRMPs, ecosystem management, and the sustainable range management program would mitigate this impact.

Fires Brigade (1,600), CSS (3,000), CS (3,000): (Significant Adverse).

Cantonment Construction. To accommodate more than 1,000 Soldiers, the installation would need to consolidate units at an area away from the main cantonment area (to the east). The amount of land required could be 75 to 200 acres depending on the size of the units. There are currently no facilities in this area. Construction would involve all new facilities including headquarters buildings, motorpools and maintenance, new utility (power, water, wastewater) distribution and collection lines, and telecommunication. Additional coordination with commercial contractors, planners, and state and federal agencies may also be needed for permitting and consultation.

Training Range Infrastructure Construction. Range expansion would occur at several ranges in order to meet the increase in training needs. Under current conditions, the ranges would not meet Standards in Training Commission (STRAC) requirements or range requirements sited in Training Circular 25-8 (US Army 2006).

Live-fire Training. Long-term impacts would be the increase in range use, resulting in the increase of ammunition and the generation of lead and other materials on FRA ranges. Also, there may be an expected increase in demand for utilities with any new ranges.

Maneuver Training. There are no plans to extend utilities to these areas therefore the impact would continue to be minimal. Other support infrastructure at training sites is adequate to accommodate these stationing scenarios.

4.7.12 Energy Demand/Generation**4.7.12.1 Affected Environment**

FRA obtains its energy from the Doyon Power Plant from outside the installation boundary. The current peak draw is approximately 12 MW, however the current feeder system to the installation is overloaded. Utilities on the installation are undergoing privatization and will be transferred to Doyon for ownership and maintenance. The utility is planning to update the electrical distribution system which would increase the carrying capacity of the existing feeder system. Also, the utility plans to return to a loop-fed system allowing for more flexibility in the distribution system to isolate problems when they occur without resulting in a loss of service. Doyon also plans to install new substations and transformers, and add a depot facility to bypass the old standby power plant located on the installation. FRA currently has a power generation plant located at 5th Street and D Street. It has a 6.5 MW capacity and has the capability to carry approximately half of the installation's energy demand. This plant is aging and contains old units. The primary intent of this facility is to provide black start capability to the Doyon Power plant if necessary.

Studies by Doyon are ongoing which explore the use of alternative energy supplies including harvesting natural gas from the Anchorage municipal landfill.

4.7.12.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).

Cantonment Construction. Long-term minor impacts are expected. Doyon Power has committed to improve infrastructure on the installation. These upgrades to the power generation capability and distribution system should be able to accommodate the increased demands on the power plant, energy distribution lines, and infrastructure that are presented by these stationing scenarios.

Training Range Infrastructure Construction. There may be additional long-term demand in training areas; though anticipated demand is slight and inconsequential compared to system capacity. Range expansion projects would also require energy distribution capacity.

Live-fire Training. Live-fire training would increase under these stationing actions, and the addition of a firing range would add demand to the power supply. However, impacts from energy use are expected to be less than significant as the power required by live-fire facilities is minimal compared to other facility types (such as housing or headquarters buildings).

Maneuver Training. Maneuver training would increase under this alternative; however, impacts to energy use and costs are expected to be less than significant. During maneuver training units power generation is typically self-contained (generators) and does not tap into existing power infrastructure.

4.7.13 Land Use Conflict/Compatibility

4.7.13.1 Affected Environment

Specific acreage for range and maneuver lands can be found in Chapter 4.7.9 Facilities. Additional data can be found within the Transformation of U.S. Army Alaska Final Environmental Impact Statement (USAG Alaska, 2004). FRA has 61,376 total acres of land; the breakdown of which is found in Table 4.7-10 below.

Table 4.7-10. Acres of USAG Alaska Land Use Planning Categories

Location	Transportation	Housing	Community	Installation Support	Facilities		Outdoor Recreation	Miscellaneous	Total
					Range & Training Land	Maintenance			
FRA	339	336	187	40	54,416	2,019	901	2,828	61,376

Transformation Environmental Impact Statement, U.S. Army Alaska (USAG Alaska, 2004).

Parts of FRA are accessible to the public for recreational use. Most of the northern part of FRA is open to recreational use, while the southern part of the installation is only open to non-motorized forms of recreation. The public has access to the installation for camping, hunting, fishing, skiing, dog sledding; and in some areas there is access for off-road recreational vehicles (ORRV) such as snowmobiles, all terrain vehicles, and airboats. Subsistence hunting is largely considered a right and is permitted on the installation. The installation also offers access to the Moose Run Golf Course and Otter Lake.

4.7.13.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Construction would occur within the main cantonment area. Short-term direct and indirect effects may stem from construction noise impacting nearby garrison staff (noise would not be audible off the installation boundary) and dust from the use of heavy construction equipment, which would be short-term and localized to the cantonment area. There may be short-term effects to land use compatibility from construction noise and activities that create dust. Construction projects would be located within areas of FRA that are not currently used for recreational or subsistence activities. Overall impacts to land uses, including recreational and subsistence activities, are expected to be less than significant.

Training Range Infrastructure Construction. Range expansion would occur within the footprint of existing ranges and pre-disturbed areas, minimizing conflicts with existing land uses. Nearby land uses may be indirectly affected by noise, dust, and the sight of equipment and human activities. However, these impacts would be localized and temporary, and are expected to be less than significant. Range surface danger zones may preclude some existing land use during range operations, but no impacts from live-fire activities are anticipated during construction.

Live-fire Training. Long-term effects are expected. The additional live-fire training at FRA ranges would conflict with recreational use of surrounding areas due to the increase in frequency that Soldiers would train on these ranges. As a result of the increased training, recreational activities such as hunting could be directly affected. The surrounding areas are uninhabited federal lands and no residential areas, schools, hospitals, or businesses are expected to be affected. The impacts from live-fire facilities would be localized to the vicinity around the ranges and are expected to be less than significant.

Maneuver Training. The increase in training frequency may result in some restrictions on public access in some training areas. These impacts may be long-term. Impacts associated with public access closures are expected to be less than significant because alternate areas on USAG Alaska lands would still be available for recreational and subsistence activities. Site-specific evaluation may identify in greater detail where the additional training would occur and may identify specific conflicts with public recreational use such as possible restrictions to some areas during hunting season.

Fires Brigade (1,600), CSS (3,000), CS (3,000): (Significant but Mitigable).

Cantonment Construction. Construction to accommodate more than 1,000 Soldiers at FRA would occur in an area roughly 75 to 200 acres in size to the east of the existing cantonment area. There may be short-term effects to land use compatibility from construction noise and activities that create dust. Long-term, permanent effects would occur as a result of modifying existing land use in the FRA cantonment area (e.g., existing antennae field) to accommodate installation support and other land use categories.

Range expansion would occur within the footprint of existing ranges and pre-disturbed areas, minimizing conflicts with existing land uses. Nearby land uses may be indirectly affected by noise, dust, and the sight of equipment and human activities. However, these impacts would be localized and temporary, and are expected to be less than significant. Range surface danger zones may preclude some existing land use during range operations, but no impacts from live-fire activities are anticipated during construction.

1 *Live-fire Training.* Long-term effects are expected. The additional live-fire training at FRA
2 ranges would slightly conflict with recreational use of surrounding areas due to the increase in
3 frequency that Soldiers would train on these ranges. As a result of the increased training,
4 recreational activities such as hunting could be directly affected. The surrounding areas are
5 uninhabited federal lands and no residential areas, schools, hospitals, or businesses are
6 expected to be affected. The impacts from live-fire facilities would be localized to the vicinity
7 around the ranges and are expected to be less than significant.

8
9 *Maneuver Training.* The increase in training frequency may result in some restrictions on public
10 access in some training areas. These impacts may be long-term. Impacts associated with
11 public access closures are expected to be less than significant because alternate areas on
12 USAG Alaska lands would still be available for recreational and subsistence activities. Site-
13 specific evaluation may identify in greater detail where the additional training would occur and
14 may identify specific conflicts with public recreational use.

15 16 17 18 **4.7.14 Hazardous Material/Hazardous Waste**

19 **4.7.14.1 Affected Environment**

20
21 Hazardous materials and wastes at USAG Alaska facilities include ammunition, UXO, POLs,
22 lead, asbestos, PCBs, pesticides, radon, and contamination found at Installation Restoration
23 Program (IRP) sites. USAG Alaska Pamphlet (PAM) 200-1 Hazardous Materials and Regulated
24 Waste Management (May, 2000) governs all aspects of managing hazardous materials at all
25 USAG Alaska facilities. The garrison's Hazardous Materials/Waste policy is founded on the four
26 environmental pillars which are pollution prevention, conservation, compliance, and restoration;
27 and the document established policy and responsibilities for complying with all relevant
28 regulations, decision documents, and Records of Decision (ROD) that have been established by
29 federal and state regulatory agencies. Further guidance has also been established in DoD
30 Directive 4715.11 Environmental and Explosives Safety Management on Operational Ranges
31 within the United States.

32
33 The garrison also have well developed pollution prevention plans to reduce or eliminate
34 hazardous materials. As a part of this program, USAG Alaska recycles fuel and oil, antifreeze,
35 batteries, brass from shell casings, aluminum cans, and in addition the garrison has set policy
36 for substituting products that pose a risk to the environment.

37
38 42 USC 6921 defines hazardous materials based on "...toxicity, persistence, degradability in
39 nature, potential for accumulation in tissue, and other related factors such as flammability,
40 corrosiveness, and other hazardous characteristics." Munitions items might be considered
41 hazardous under the following conditions: 1) If contents or by products are identified as
42 hazardous under appropriate Federal or State statute and regulations; 2) If these hazardous
43 substances are deposited at Army rangelands in quantities or densities which require them to
44 be managed as hazardous wastes; 3) Residues of hazardous materials remain on the scrap
45 material (uncombusted portions of the cartridge after detonation); and /or 4) Contents of
46 cartridges that fail to function (duds) in need of demilitarization or disposal (to be addressed
47 under Human Health and Safety).

48
49 Ammunition, Live-fire, and UXO: The impact area at Eagle River Flats, where UXO and other
50 hazardous materials may be found, has been restricted to unauthorized personnel. This is
51 indicated by warning signs posted around the area, and through other forms of notice.

Petroleum, Oils, Lubricants (POL), and Storage Tanks and IRP Sites: The installation has 22 above ground storage tanks (AST) ranging in capacity from 300 gallons to 50,000 gallons. These ASTs are located throughout the cantonment area; they generally contain fuels and fuel oil. The installation has a total fuel capacity that does not exceed 420,000 gallons; therefore an Oil Discharge Prevention and Contingency Plan is not required; however, the installation does have a spill prevention plan for all storage areas. FRA also has 42 underground storage tanks (UST). Thirty-nine of these USTs are located on the main cantonment area. The other three are located at National Guard facilities located within Fort Richardson's boundaries.

IRP: Over time, past military activities have contributed to contaminant releases to the environment. These included sources such as motorpools, industrial operations, and munitions use in impact areas, and from aircraft hangars. Some of the hazardous materials include PCBs, white phosphorus, petroleum products, and chlorinated solvents. The Army has identified and is or has conducted remediation activities at approximately 114 of these sites. More information on these sites can be found in the Final Environmental Impact Statement for the Permanent Stationing of the 2/25th Stryker Brigade Combat Team (February 2008).

Lead: Lead has been identified in Family housing units within paint, and has been identified in elevated levels in dust and exterior soils. All buildings have been inspected for lead on the interior and exterior surfaces (HartCrowser 1997).

Asbestos: 1997 surveys of facilities and Family housing units uncovered asbestos in most of the units surveyed. While much of the material appeared to be intact and in good condition, any materials that seemed damaged were abated or removed completely. Additionally, neighborhood revitalization programs have resulted in the removal of asbestos from many of the Family housing units. All of the materials removed are documented for disposal as a hazardous waste at the local landfill. Asbestos may be found in linoleum and floor tile, as part of adhesive, wallboard, pipe insulation, pipe-fitting insulation, and tarpaper. In addition to guidance found in USAG Alaska PAM 200-1, the garrison has an Asbestos Management Plan in place to reduce exposure to unit occupants and workers.

Pesticides and Herbicides: Pest control materials used by the installation are handled in accordance with Fort Richardson's Integrated Pest Management Plan.

Radon: Radon testing is conducted throughout USAG Alaska facilities to ensure compliance with the Army's Radon Reduction Program identified in AR 200-1. The garrison documents radon surveys and results of all surveys. While many of the structures at FRA were found to have exceeded the 4 pCi/L regulatory limit, FRA's radon records were inadvertently destroyed so the installation maintains a robust radon monitoring and mitigation program in an effort to replace that documentation. In accordance with regulation all new facilities constructed at FRA will undergo radon surveys.

Hazardous Wastes/Biomedical Waste: The installation is registered with EPA as a Large Quantity Generator of hazardous waste due to the installation's many activities that support military operations and readiness. These wastes are stored properly in locations throughout the installation at Satellite accumulation points, in accordance with USAG Alaska PAM 200-1, and are centrally processed (Building 45-125) for off-post disposal. While previous years the installation generated a significant amount of hazardous waste (2001 for example saw a spike due to IRP restoration of PCB contaminated soil), the average for FRA is less than 100,000 pounds per year.

Very little biomedical waste is generated by the installation, and is stored in medical or dental facilities. These wastes are handled in accordance with Army policy.

4.7.14.2 Environmental Consequences

CSS (1,000), CS (1,000): (Less than Significant).

Cantonment Construction. Short-term effects would be expected. If either of these scenarios were implemented at FRA, construction and de-construction of structures would generate wastes, some of which may be hazardous due to the presence of asbestos and lead in many of the existing structures. The installation would ensure that any removal and disposal of these materials would be in accordance with well established federal, Army, and USAG Alaska policy for handling hazardous materials and hazardous wastes. Any new construction would involve the testing, recordation, and mitigation (if necessary) for Radon. Furthermore, the installation would ensure that none of the identified construction sites would be collocated with IRP sites.

The addition of Soldiers may drive the need for additional motorpools where POL and other materials would be generated and temporarily stored. The additional tactical and fleet vehicles may require additional ASTs/USTs, wash racks, and thus oil-water separators.

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.

Additional Soldiers may increase the amount of biomedical wastes generated from dental and medical facilities on-post. These wastes would be processed in accordance with current standard operating procedure and regulations. Because the installation is already considered a Large Quantity Generator no additional permitting or significant actions are likely to be required.

Pesticides existing in soils at the FRA may have adverse effects to nearby waterbodies during construction due to stormwater runoff. Implementation of BMPs and mitigations to minimize runoff from construction sites would be required.

Training Range Infrastructure Construction. The installation is currently exploring the expansion of some of its training ranges. Any material uncovered in expansion areas (expansion areas are likely to be in locations that have been previously used or disturbed) would be handled in accordance with established policy.

Live-fire Training. Long-term effects are expected. These scenarios would increase the frequency of Soldier live-fire training on ranges at FRA; 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 a great deal 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.

DUD items may also be produced from the use of the MK-19 grenade machine gun. Activities supported by combat engineers or EOD units may train with explosive material. The use of

explosive material would be consistent with current uses, and would not pose a significant impact to human health or the environment as these materials would be consumed, stored, or disposed of in accordance with all appropriate safety regulations.

No new weapon types may be introduced to training areas, thereby precluding the need for additional ammunition storage classification areas. Therefore, handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations.

Maneuver Training. 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. Best management practices would be practiced at each of these proposed facilities, and project area personnel would follow USEPA protocol for using and handling hazardous materials, such as POLs. Spill prevention control countermeasure plans would be updated to reflect changes implemented as part of stationing scenarios.

Fires Brigade (1,600): (Less than Significant).

Cantonment Construction. Construction of new structures would generate wastes in new areas outside the main cantonment area. Some of these materials may be hazardous (pesticides and herbicides, POLs, and other materials). The installation would continue to ensure proper handling and storage of these materials in accordance with well established federal, Army, and USAG Alaska policy for handling hazardous materials and hazardous wastes. New construction would also involve the testing, recordation, and mitigation (if necessary) for Radon. Furthermore, the installation would ensure that none of the identified construction sites would be collocated with IRP sites.

The addition of Soldiers may drive the need for additional motorpools where POL and other materials would be generated and temporarily stored. The additional tactical and fleet vehicles may require additional ASTs/USTs, wash racks, and thus oil-water separators.

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.

Additional Soldiers may increase the amount of biomedical wastes generated from dental and medical facilities on-post. These wastes would be processed in accordance with current standard operating procedure and regulations. Because the installation is already considered a Large Quantity Generator no additional permitting or significant actions are likely to be required.

Training Range Infrastructure Construction. The installation is currently exploring the expansion of some of its training ranges. Any material uncovered in expansion areas (expansion areas are likely to be in locations that have been previously used or disturbed) would be handled in accordance with established policy.

Live-fire Training. Long-term effects are expected. These scenarios would increase the frequency of Soldier live-fire training on ranges at FRA; thus increasing the amount of lead

1 bullets and other munitions expended in the range area. Live-fire small arms ranges would
2 retain their berms to stop projectiles fired at the ranges. Although a great deal more lead would
3 be fired into impact berms, the installation has mitigation measures in place to ensure berms are
4 well maintained and re-graded as needed.

5
6 DUD items may also be produced from the use of the MK-19 grenade machine gun. Activities
7 supported by combat engineers or EOD units may train with explosive material. The use of
8 explosive material would be consistent with current uses, and would not pose a significant
9 impact to human health or the environment as these materials would be consumed, stored, or
10 disposed of in accordance with all appropriate safety regulations.

11
12 The proposed alternatives do not contemplate the introduction of any new weapons types to
13 Fort Richardson ranges. The amount of ammunition required however may not exceed the
14 ammunition storage capacity in these areas; and handling and storage methods, disposal
15 protocols, and safety procedures would continue to be conducted in accordance with existing
16 regulations.

17
18 *Maneuver Training.* Transportation of personnel and use of flammable or combustible
19 materials, such as fuel or ordnance (i.e., weaponry or equipment), could increase the potential
20 for spills or releases of hazardous materials, especially in areas not previously used frequently.
21 Best management practices would be practiced at each of these proposed facilities, and project
22 area personnel would follow USEPA protocol for using and handling hazardous materials, such
23 as POLs. Spill prevention control countermeasure plans would be updated to reflect changes
24 implemented as part of stationing scenarios.

25
26
27 **CSS (3,000), CS (3,000): (Significant but Mitigable).**

28
29 *Cantonment Construction.* The addition of facilities away from the main cantonment area would
30 be required to support this level of Soldier growth at FRA. This would mean the generation of
31 more wastes from the new Soldiers and their activities. A scenario of 3,000 Soldiers would
32 mean the construction of additional motorpools that may potentially double the amount of
33 motorpool hazardous material storage, resulting in the doubling of staff dedicated to monitoring
34 and maintaining those sites, ultimately increasing storage and staff requirements for the
35 installation. Furthermore, the addition of 3,000 Soldiers would require additional ASTs/USTs,
36 wash racks, and thus oil-water separators; increase the potential for spills or releases of
37 hazardous materials to the environment.

38
39 *Training Range Infrastructure Construction.* The installation is currently exploring the expansion
40 of some of its training ranges. Any material uncovered in expansion areas (expansion areas are
41 likely to be in locations that have been previously used or disturbed) would be handled in
42 accordance with established policy.

43
44 *Live-fire Training.* Long-term effects are expected. These scenarios would increase the
45 frequency of Soldier live-fire training on ranges at FRA; thus increasing the amount of lead
46 bullets and other munitions expended in the range area. Live-fire small arms ranges would
47 retain their berms to stop projectiles fired at the ranges. Although a great deal more lead would
48 be fired into impact berms, the installation has mitigation measures in place to ensure berms are
49 well maintained and re-graded as needed.

DUD items may also be produced from the use of the MK-19 grenade machine gun. Activities supported by combat engineers or EOD units may train with explosive material. The use of explosive material would be consistent with current uses, and would not pose a significant impact to human health or the environment as these materials would be consumed, stored, or disposed of in accordance with all appropriate safety regulations.

No new weapon types may be introduced to training areas there. The amount of ammunition required however may not exceed the ammunition storage capacity in these areas; and handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations.

Maneuver Training. 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. Best management practices would be practiced at each of these proposed facilities, and project area personnel would follow USEPA protocol for using and handling hazardous materials, such as POLs. Spill prevention control countermeasure plans would be updated to reflect changes implemented as part of stationing scenarios.

4.7.15 Traffic and Transportation

4.7.15.1 Affected Environment

FRA is accessible via air, rail, road, and sea. Nearby Anchorage has two primary highways; Glenn Highway offers access to FRA from the northeast; and it connects to Parks Highway in Palmer where it continues to Glennallen and ultimately connects to Richardson Highway (offering access to Fairbanks approximately 350 miles to the north).

The installation has two gates offering access to the main cantonment area; one main gate from Glenn Highway, and one gate from Elmendorf AFB. There are also four primary roads and secondary roads allowing access throughout the cantonment area. The installation periodically experiences traffic flow issues at the main gate, especially due to the morning commute. FRA is currently considering commissioning a traffic study to evaluate alternatives and mitigations.

The Alaska Railroad travels near to the installation to the north of the cantonment area and offers access to Fort Wainwright and central Alaska. Garrison staff is currently considering upgrading and adding access to the Alaska Railroad to points located on the installation. The Alaska Railroad also offers access to the Ports of Seward and Whittier.

The military ships a variety of types of cargo through the Port of Anchorage as well, which also services Elmendorf AFB. During winters, the Port of Anchorage is sometimes closed due to ice; however, supplies may be shipped through the Ports of Seward and Whittier which are ice-free year-round.

4.7.15.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600): (Less than Significant).

Cantonment Construction. The addition of any of these scenarios would generate additional traffic from construction equipment and workers. Traffic impacts would be short-term, and would be experienced at the main gate to the cantonment area and on FRA's primary and secondary streets. While traffic flow may have minimal impacts to Glenn Highway, there could be back-ups at the gate entering the installation, driving the possible redistribution of traffic to the secondary gate entering the installation from Elmendorf AFB, or altering flow at the main gate.

Long-term effects would be expected to general traffic conditions in the cantonment area. There would be an expected shortfall of organizational and motorpool parking associated with this level of Soldier strength. The action would increase the amount of Soldiers, their Families, and any support personnel (including military fleet vehicles and POVs) operating within the cantonment area. The installation may consider construction of additional motorpool and parking facilities to accommodate this level of growth.

Training Range Infrastructure Construction. Short-term effects from construction equipment in the range areas are anticipated. The action would temporarily increase construction traffic to construction sites, effecting flow at the front gate, on the cantonment area, and potentially the communities surrounding the installation.

Live-fire Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic.

Maneuver Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic.

Company level training and above would occur at DTA. Effects to traffic on the Glenn, Parks, and Richardson Highways are likely to be short-term because in order to meet training requirements these units would travel to DTA only a few times per year. The garrison enforces a convoy procedure permitting groups of vehicles (or serials) to travel in no more than 20 vehicles per serial, and maintaining a gap of approximately 20 minutes between serials. Following this procedure reduces the impact to traffic on these major Highways.

CSS (3,000), CS (3,000): (Significant Adverse).

Cantonment Construction. Depending on the siting and location of construction to accommodate either of these scenarios, the traffic patterns on post may need to be further evaluated. Construction equipment and worker vehicles would have short-term impacts at the main gate and at the roads around the designated construction site. There would be a considerable increase in vehicles at the main gate, further exacerbating traffic flow there and possibly driving the installation to consider temporary redirection alternatives. Because the main gate is one of only two entrances to the installation the options for flow control may be limited.

Long-term effects would be expected to general traffic conditions in the cantonment area. There would be an expected shortfall of organizational and motorpool parking associated with this level of Soldier strength. The action would increase the amount of Soldiers, their Families, and any support personnel (including military fleet vehicles and POVs) operating within the

cantonment area. The installation may consider construction of additional motorpool and parking facilities to accommodate this level of growth.

Training Range Infrastructure Construction. Short-term effects from construction equipment in the range areas are anticipated. The action would temporarily increase construction traffic to construction sites, effecting flow at the front gate, on the cantonment area, and potentially the communities surrounding the installation.

Live-fire Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic.

Maneuver Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic.

Company level training and above would occur at DTA. Effects to traffic on the Glenn, Parks, and Richardson Highways are likely to be short-term because in order to meet training requirements these units would travel to DTA only a few times per year. The garrison enforces a convoy procedure permitting groups of vehicles (or serials) to travel in no more than 20 vehicles per serial, and maintaining a gap of approximately 20 minutes between serials. Following this procedure reduces the impact to traffic on these major Highways.

4.7.16 Socioeconomics

4.7.16.1 Affected Environment

FRA is located approximately 9 miles to the northeast of the City of Anchorage. The ROI is considered the Anchorage region which also includes Elmendorf AFB. The Matanuska-Susitna Borough and some communities associated with the Kenai Peninsula Borough are also located near FRA. According to the U.S. Census Bureau 2000 data, Anchorage had (at that time) a population of 260,283 which is estimated to be 40 percent of the population of the State of Alaska¹⁰. The Cook Inlet Region, Inc serves as the regional Native Corporation for this area that is subject to the Alaska Native Claims Settlement Act. The Chugach Alaska Corporation and Ahtna, Inc also have peripheral interests in the region. The Transformation of U.S. Army Alaska EIS (USAG Alaska, 2004) provides more information on the villages and corporations within these regions. According to 2006 estimates by the Census Bureau, the estimated Anchorage population in the workforce is 158,353, and has a median household income of \$63,656. There are approximately 110,284 housing units located in the region.

In 2007, Fort Richardson and Elmendorf AFB developed a Joint Housing Market Analysis to assess the private sector housing market's potential to accommodate military families through transition to privatization and for the military to achieve the minimum number of authorized housing units from 2007 to 2012. During this transition period, both FRA and Elmendorf AFB are projecting growth in mission and personnel. The study reviewed housing requirements for both Soldiers with Families and unaccompanied/ bachelor Soldiers. The study concluded that based on current housing inventories there was an overall surplus of family housing units (when

¹⁰ The U.S. Census Bureau Web site did not show updated information representing 2006 population estimates as was represented for the Fairbanks North Star Borough.

combining the numbers for both installations) to accommodate known growth through 2012¹¹. When reviewing the housing units for unaccompanied Soldiers, the study identified a total deficit of 798 units. Although the rental supply of housing units is expected to increase dramatically over the next five years at an average annual growth rate of 0.6 percent; the growth covered by this market analysis may not include potential growth associated with the proposed action.

Currently, there are seven Family Housing neighborhoods consisting of 1,435 units and 273 acres. These are adjacent by hills and forest to the south and east (respectively), which work as a barrier against most noise and pollution generated from use of Glenn Highway. The installation has begun a revitalization program for a few of these neighborhoods. It should be noted that revitalization and reconstruction efforts have been initiated for much of the barracks and housing (for enlisted unaccompanied personnel).

The state-owned Anchorage International Airport is the largest airport in Alaska and is also the largest air cargo handler and transfer site in the United States. Additionally, the Port of Anchorage handles approximately 85 percent of the general cargo for the regions serviced by the Alaska Railroad. Healthcare services are offered by numerous providers in the region. Military healthcare facilities include the U.S. Army medical clinic at FRA, the Air National Guard Medical Squadron, and the 3rd Medical Group at Elmendorf AFB.

Schools in Anchorage fall within the Anchorage School District. The student-to-teacher ration is much lower than the national average and expenditures for students is much higher than the national average, largely because the local contribution to the school district is approximately 30 percent of the operating budget (the contributions are considerably less in rural areas).

4.7.16.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600): (Less than Significant).

A preliminary socioeconomic analysis of potential effects was conducted for each of the stationing scenarios identified to be suitable for USAG Alaska. This includes the potential stationing 1,000 or 3,000 Soldiers as a result of Army Growth activities. The results of this analysis can be found in Appendix A of this document.

The addition of Soldiers and their Families may have a beneficial effect to the local economy; however, the 2007 Joint Housing Market Analysis conducted by Fort Richardson and Elmendorf AFB concluded that there may be shortfalls in currently available housing units to accommodate new growth. There may be some flexibility in the City of Anchorage and local communities to accommodate a limited amount of growth. Installation staff indicated there may be as many as 270 buildable lots within the Anchorage Metropolitan area. Competing factors include growth in the local economy and growth at Elmendorf AFB.

There would be an expected increase in school-aged children. As indicated above the City of Anchorage has a lower student-to-teacher ratio than the national average. Appendix A indicates through preliminary analysis that the addition of 1,000 Soldiers may add approximately 225 school-aged children to the school system, spread out from grades K-12. The school system may be able to accommodate this level of growth. If either of these growth scenarios

¹¹ Elmendorf AFB had a surplus of approximately 875 housing units, Fort Richardson showed a deficit of 615 units, equating to a total available surplus of 260 housing units.

were to be implemented at Fort Richardson the Army would need to determine a more accurate number of school-aged children eligible to enter the local school system.

Cantonment Construction. Construction of new facilities at Fort Richardson may have a beneficial short-term effect to the local commercial construction contractor market. The requirement for new facilities equates to MILCON funding being spent on commercial services which could in-turn improve employment outside the installation boundaries.

Training Range Infrastructure Construction. Short-term beneficial effects are expected. Construction of ranges would have a temporary beneficial effect from an increase in military spending on commercial goods and construction services; therefore resulting in a positive influence to employment and income.

Live-fire Training. No impact.

Maneuver Training. No impact.

CSS (3,000), CS (3,000): (Significant but Mitigable).

There would be a significant shortfall in housing creating short- and long-term effects to the local market. As indicated in the Joint Housing Market Analysis there may be both a shortfall in existing vacant space and in buildable space directly affecting the military and local community's ability to absorb the excess Soldiers and Family members.

Appendix A indicates through preliminary analysis that the addition of 3,000 Soldiers could equate to approximately 745 additional school-aged children enrolling in the local school district. FRA currently leases a Family Center from the city of Anchorage. As a result of the increased school-aged children attending public schools under these scenarios, the installation may lose the use of a Family Center back to the local school district. A determination of potential effects would need to be coordinated with the anchorage school district.

Cantonment Construction. Construction of new facilities at Fort Richardson may have a beneficial short-term effect to the local commercial construction contractor market. The requirement for new facilities equates to MILCON funding being spent on commercial services which could in-turn improve employment outside the installation boundaries.

Training Range Infrastructure Construction. Short-term beneficial effects are expected. Construction of ranges would have a temporary beneficial effect from an increase in military spending on commercial goods and construction services; therefore resulting in a positive influence to employment and income.

Live-fire Training. No impact.

Maneuver Training. No impact.

4.8 Fort Wainwright, Alaska

Fort Wainwright Summary

This section provides an overview of the actions the Army would take to implement the Proposed Action under each stationing scenario at FWA. The Army would undertake four primary types of actions to support new unit stationing. These actions include cantonment construction, training infrastructure construction, live fire training, and maneuver training activities. The discussion of environmental consequences to each resource discusses the impacts of each type of activity and assesses the combined impact of these activities on a given resource. Table 4.8-1 below lists the environmental impacts which are anticipated to occur if the Army were to implement various different unit stationing assignments to FWA to support the growth of the Army needed to support operations in the Pacific Theater. Stationing scenarios possible at FWA include the stationing of 1,000 additional Combat Support (CS) or Combat Service Support Soldiers (CSS), 3,000 additional CS or CSS Soldiers, or a new Fires Brigade. A summary of the symbology which discusses intensity of anticipated environmental impacts is provided below:

Description of VEC Impact Ratings

○	No impact, minimal or minor impacts are anticipated
◐	Less than Significant
◑	Significant but Mitigable
⊗	Significant Adverse impacts
+	Beneficial Impact
N/A	Not Applicable

Table 4.8-1. Fort Wainwright VEC Ratings

Fort Wainwright					
VEC	Combat Service Support (1,000 Soldiers)	Combat Support (1,000 Soldiers)	Fires Brigade (1,600)	Combat Service Support (3,000 Soldiers)	Combat Support (3,000 Soldiers)
Air Quality	Significant Adverse	Significant Adverse	Significant Adverse	Significant Adverse	Significant Adverse
Air Space	No Impact	No Impact	No Impact	No Impact	No Impact
Cultural	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Noise	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Soil Erosion Effects	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Biological Resources	Minor	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Wetlands	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Water Resources	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Facilities	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Energy Demand/ Generation	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Land Use Conflict/ Compatibility	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Hazardous Materials/ Hazardous Waste	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
Traffic and Transportation	Less than Significant	Less than Significant	Less than Significant	Significant but Mitigable	Significant but Mitigable
Socioeconomics	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable	Significant Adverse	Significant Adverse

Fort Wainwright Introduction

Fort Wainwright (FWA) is located in central Alaska and is approximately 120 miles south of the Arctic Circle, adjacent to the City of Fairbanks. The installation and its training areas encompass over 1 million acres of land, 13,423 acres of that being the main cantonment area. FWA is home to the 1/25th Stryker Brigade Combat Team and subordinate units, the 507th Signal Company, Northern Warfare Training Center, Cold Regions Test Center and the Cold Regions Research and Engineering Laboratory, among other units.

FWA training areas include Tanana Flats Training Area (TFTA), and Yukon Training Area (YTA) and Donnelly Training Area (DTA). If Soldiers are stationed at either FWA or Fort Richardson

under a given stationing scenario, the impacts at DTA would be expected to be the same in either instance. U.S. Army Alaska training policy is the same at both FWA and FRA and company and larger units would conduct maneuver training at DTA rather than at their home station. Figure 4.8-1 below identifies the interior Alaska training areas, and illustrates their geographic location in relation to Fort Richardson.

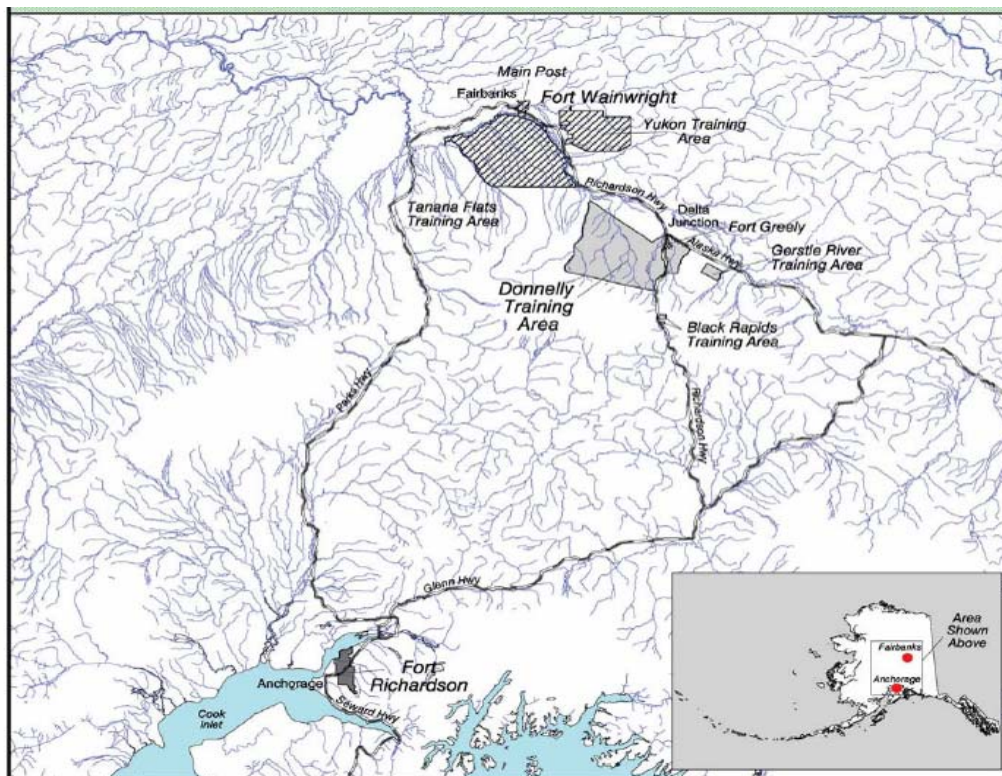


Figure 4.8-1. Map of Fort Wainwright, Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area, and their geographic location in relation to Fort Richardson

4.8.1 FWA Proposed Actions to Support Army Stationing Scenarios

This section discusses actions that the Army would undertake to support each of the five stationing scenarios that the Army might choose from to implement at FWA to support operations in the Pacific Theater. These scenarios include the stationing of up to 3,000 CS or CSS Soldiers and the possibility of stationing a Fires Brigade at FWA. The units, equipment and training are described more fully in Chapter 2 of the SPEIS.

Scenario 1: Growth by 1,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on FWA. Growth by 1,000 additional Soldiers would drive requirements to demolish some existing facilities and replace them with the necessary facilities in the existing cantonment area. Table 4.8-2 lists the space and size requirements for key facilities associated with the growth of 1,000 CSS Soldiers.

Table 4.8-2. Estimated Facilities Requirements at Fort Wainwright

Garrison Facilities	Requirement
Fuel Storage (gallons)	30,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	18,000
Company Offices (sf)	12,000
Unit Storage Buildings (sf)	17,000
Barracks Space (sf)	38,800
Military Vehicle Parking (sf)	400,000
Vehicle Maintenance Shop (sf)	30,00

Range Construction: To accommodate the stationing of new CSS Soldiers, Fort Wainwright will need to upgrade several training range facilities to meet doctrinal training requirements of 1,000 additional combat service support Soldiers. These Soldiers will primarily need to engage in basic marksmanship tasks and qualifications with individual and crew served weapons. As part of this scenario an existing modified record fire range for Soldier rifle qualifications would be expanded and a new combat pistol range would be sited on an existing range footprint. Figure (XX) depicts the current location of each of the ranges below. The scope of the necessary expansion and purpose of each range is described below:

Modified Record Fire Range (MRF): This range is used to train support unit Soldiers in basic marksmanship tasks. The range teaches Soldiers to quickly aim and engage stationary infantry targets. To implement the proposed action 8 lanes would need to be added to the existing range to expand its training capacity.

Combat Pistol Qualification Course (CPQC): This combat pistol range is used to train Soldiers to identify, engage, and defeat an array of targets using the 9mm, .38 caliber, or .45 caliber

pistol. This project involves the siting of the CPQC on another existing range to allow for increased throughput capacity to meet increased training requirements at Ft. Wainwright.

Live Fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. Firing activities would be conducted on existing qualification ranges on FWA and on those ranges expanded to accommodate increased live-fire training activities. In comparison to the 1/25th SBCT and other units stationed at FWA, 1,000 additional CSS Soldiers would increase existing live fire requirements on qualification ranges by between 10-15%. These units do not typically engage in CALFEX training events though they would participate in some urban training scenarios at DTA.

Maneuver Training: This scenario would not involve an appreciable increase in the amount, type, or scale of maneuver training that takes place in Alaska. CSS units stationed at FWA under this scenario would increase light and heavy military cargo truck traffic and would not include armored personnel carrier traffic. CSS units will support the maneuver training exercises of existing combat units by supporting their logistics and support requirements. Off-trail maneuver by these units would be limited, with major operations consisting of resupply, transport of equipment and command and control functions. A majority of maneuver operations would take place at DTA, TFTA, or YTA. Much of this maneuver would occur on existing road and training infrastructure. Additional small unit maneuver support missions at the platoon level would be supported at FWA's existing maneuver sites. Overall maneuver impacts would increase by less than 10% at FWA with a bulk of maneuver impacts occurring on roads and trails.

Scenario 2: Growth by 1,000 Additional Combat Support Soldiers

Cantonment Construction: No Change from Scenario 1. Cantonment construction would take place in the existing cantonment area by demolition of unneeded facilities and replacement with required barracks, offices, motor pools and other facilities.

Range Construction: To accommodate the stationing of 1,000 new CS Soldiers, FWA will need to conduct the same firing range construction as discussed in Scenario 1. These upgrades of existing ranges will allow FWA to properly meet the training range certification requirements of its Soldiers. In addition to the upgrades of the CPQC and MRF ranges, the increased numbers of crew served weapons (machine gun systems, .50 Caliber systems, MK-19 grenade machine gun) will require an upgrade of the Multi-purpose Machine Gun range as part of this stationing scenario. The MPMG would be upgraded at its current location to the south of the main cantonment area. A description of the MPMG is provided below.

Multipurpose Machine Gun Range (MPMG): This range is designed to train Soldiers to engage stationary infantry and mobile vehicular targets with the full range of Army machine guns to include the M249, M60, M240, and .50 caliber machine guns. This range would be extended and upgraded with additional firing lanes to allow for sniper field fire and the qualification of additional machine gun crews.

Live Fire Training: Training activities of CS units would primarily involve many of the same weapons qualifications discussed under Scenario 1, with individual weapons (pistols, rifle and light machine gun) and crew served weapons qualification with heavy machine guns. CS units would also be required to conduct certifications with MK-19 grenade launching systems and

also demolitions in the case of combat engineering units. Firing activities would be conducted on existing qualification ranges on FWA. In comparison to the 1/25th SBCT and other units stationed at FWA, 1,000 additional CS Soldiers would increase existing live fire requirements on qualification ranges by 15-20%. These units do not typically engage in CALFEX training events though they would participate in some urban training scenarios at DTA.

Maneuver Training: CS units stationed under this scenario would participate in small unit (platoon and below) maneuvers at FWA. These units would also support combat maneuver units during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at Donnelly Training Area and other USAG Alaska maneuver areas. Engineer and military police units under this stationing scenario would be anticipated to execute about 25-30 percent of their maneuver training at FWA as small units and the remainder of their maneuver training during large-scale maneuver training rotations at DTA, TFTA, and YTA. The total increase in maneuver impact would not be anticipated to be more than 10-20% over what currently takes place on FWA's small unit maneuver training areas. While CS units are supporting combat units and executing small unit maneuvers, both on and off-road maneuver would be required. CS units would conduct maneuvers in most cases in tracked armored personnel carriers, armored HMMWVs, and light and medium tactical trucks. In some events, shallow excavation activities may also be required as part of standard operations for engineers and other CS units.

Scenario 3: Growth by 3,000 Additional Combat Service Support Soldiers

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage buildings, motor pools for military vehicle parking, and other maintenance facilities would be sited on FWA. Growth by 3,000 additional Soldiers would increase the current Soldier population by just under 50%. In addition, this increase would be accompanied by a large increase in the family dependent population of Fort Wainwright, which would also increase by approximately 50%. Such an increase would drive requirements to expand construction to areas outside the current built-up portion of the FWA cantonment area. Construction and demolition of facilities in the existing cantonment area would take place to support new unit stationing to the extent allowable given the available space, but additional non-built-up area would be modified. Power, sewage lines, water lines and roads would need to be extended to the expansion location for the new cantonment area. This area would consist of between 100-150 acres of land to the North of the current cantonment area (See blue shaded area Figure 4.8-2 below). In addition, a larger family housing area would need to be set aside to accommodate this level of growth. A potential area for such growth in family residential housing is the area in the Southeastern corner of the installation highlighted in the lavender shaded area in Figure 4.8-2 below.

Table 4.8-3 lists the space and size requirements for key facilities associated with the growth of 3,000 CSS Soldiers.

Table 4.8-3 Fort Wainwright Facilities Requirements for Scenario 3 and 4

Garrison Facilities	Requirement
Fuel Storage (gallons)	90,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	54,000
Company Offices (sf)	300,000

Unit Storage Buildings (sf)	40,000
Barracks Space (sf)	300,000
Military Vehicle Parking (sf)	1,200,000
Vehicle Maintenance Shop (sf)	90,00

Range Construction: To accommodate the stationing of 3,000 new CSS Soldiers, Fort Wainwright will need to upgrade training ranges. Upgrades will be required to meet doctrinal training requirements of 3,000 additional combat support Soldiers. These Soldiers will primarily need to engage in basic marksmanship tasks and qualifications with individual and crew served weapons. As part of this scenario range upgrades to the MRF, CPQC and MPMG would occur as described in scenario 2. In addition, another MRF range would be constructed in the south end of the installation to accommodate the increased weapons qualification requirements. Range upgrades and construction would occur in the green shaded area in Figure 4.8.2 below.

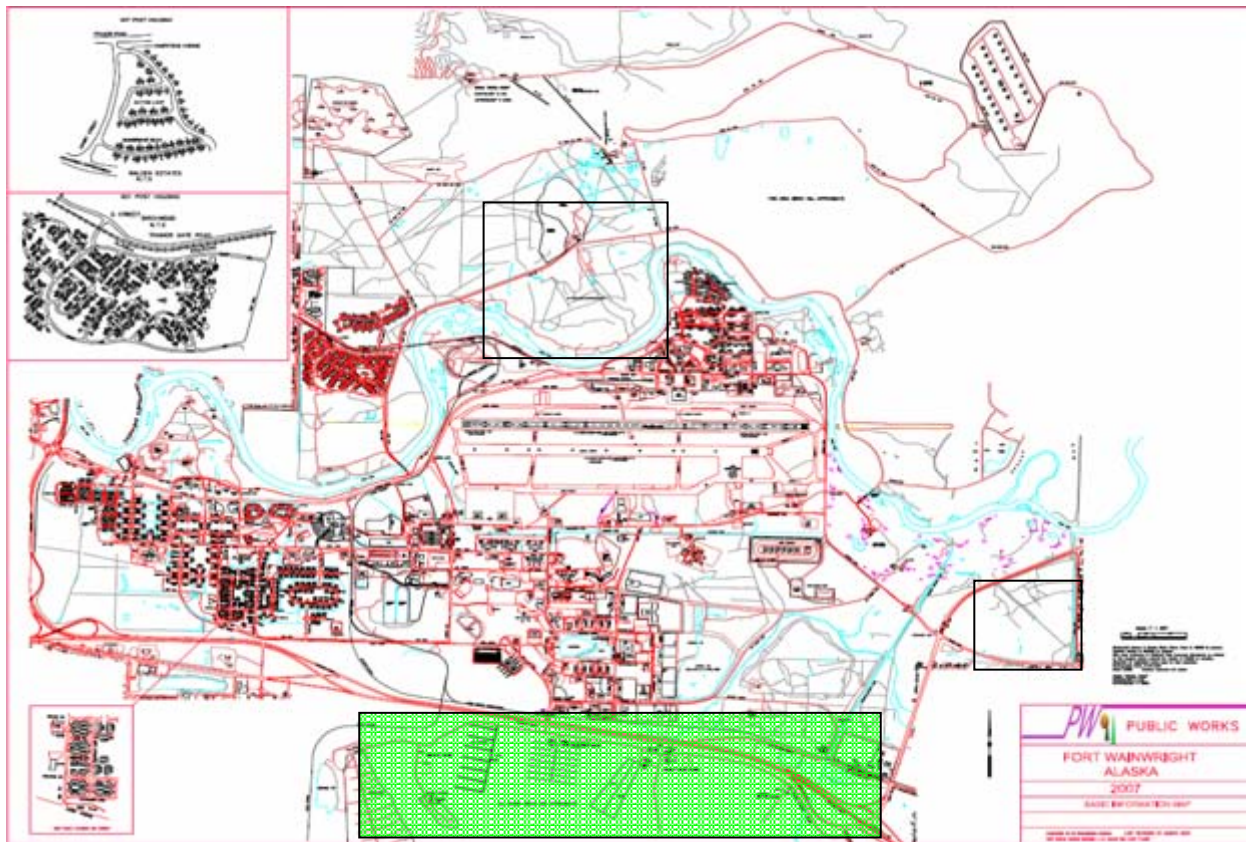


Figure 4.8-2. Construction location for additional cantonment facilities under stationing scenarios 3 to 5

Live Fire Training: Training activities of CSS units would primarily involve weapons qualifications with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. Firing activities would be conducted on existing qualification ranges on FWA and newly constructed ranges. In comparison to the 1/25th

SBCT and other units stationed at FWA, 3,000 additional CSS Soldiers would increase existing live fire requirements on qualification ranges by 30-45%. These units do not typically engage in CALFEX training events though they would participate in some urban training scenarios at DTA.

Maneuver Training: CSS units will support the maneuver training exercises of combat units; supporting their logistics and support requirements. Off-trail maneuver by these units would be limited, with major operations consisting of resupply, transport of equipment and command and control functions. A majority of maneuver operations would take place at Donnelly Training Area and other USAG Alaska maneuver areas. Much of this maneuver would occur on existing road and training infrastructure. Additional small unit maneuver support missions at the platoon level would be supported at FWA's existing maneuver sites. Off-road travel would be minimal and significant off-road maneuver requirements are not anticipated as part of this scenario.

Scenario 4: Growth by 3,000 Additional Combat Service Support Soldiers

Cantonment Construction: Same proposed action as scenario 3.

Range Construction: All range upgrades discussed in Scenario 3 would take place. In addition, another specialized range would be constructed (either an Engineer demolition or qualification range; or Urban Assault Course) depending on the specific types of combat support units. This range would be sited in proximity to existing ranges to the south of FWA's main cantonment area and would be used to maintain the special weapons skills and training that would be required of CS units stationed at FWA.

Live Fire Training: Training activities of CS units would primarily involve many of the same weapons qualifications discussed under scenario 3, with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. CS units would also be required to conduct certifications with MK-19 grenade launching systems and also demolitions training and certification in the case of combat engineering units. Firing activities would be conducted on newly constructed and existing qualification ranges at FWA. In comparison to the 1/25th SBCT and other units stationed at FWA, 3,000 additional CS Soldiers would increase existing live fire requirements on qualification ranges by 45-60%.

Maneuver Training: CS units stationed under this scenario would participate in small unit (platoon and below) maneuvers at FWA, AK. These units would support combat units during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at Donnelly Training Area and other USAG Alaska maneuver areas. Engineer and military police units under this stationing scenario would be anticipated to execute about 25-30 percent of their maneuver training at FWA as small units and the remainder during large-scale maneuver training rotations within the boundaries of USAG Alaska training areas. The total increase in maneuver impact would be anticipated to be 30-60% over what currently takes place on FWA's small unit maneuver training areas. While CS units are supporting combat units and executing small unit maneuvers, both on and off-road maneuver would be required. In some events, shallow excavation activities may also be required as part of standard operations.

Scenario 5: Growth by an additional Field Artillery (Fires) Brigade

Cantonment Construction: As part of this alternative, additional garrison infrastructure such as company operations facilities (COFs), Brigade and Battalion Headquarters buildings, storage

buildings, motor pools for military vehicle parking, and other maintenance facilities would be constructed at FWA. The stationing of a Fires Brigade at FWA would involve the stationing of approximately 1,600 additional Soldiers which would increase the current Soldier population by about 25%. In addition, this increase would be accompanied by a corresponding increase in the dependent population of FWA, which would also increase by approximately 25%. Administratively, the units of the Fires Brigade would need to be co-located to effectively coordinate training and command and control of its subordinate units. Such an increase in Soldier stationing requirements would drive a need to expand the cantonment area outside the current footprint of the FWA as discussed in scenarios 3 and 4. Facilities could not be sited in the current cantonment area and power, sewage lines, water lines and roads would need to be extended to the expansion location for the new cantonment area. This area would consist of between 75-120 acres of land to the north of the Chena River and the current cantonment area. The footprint would be sited in the same vicinity as depicted by figure 4.8-2 (blue shaded area), though the overall cantonment expansion would only be slightly more than half the size of what was proposed in scenario 3. In addition, acreage would need to be utilized for residential housing construction, though only half as much land for additional residential housing would be required. Senior enlisted Soldiers and single officers would live off-post in the Fairbanks community.

Table 4.8-4 listed the space and size requirements for key facilities associated with the stationing of a new Fires Brigade at FWA.

Table 4.8-4. Fort Wainwright Facilities Requirements for Scenario 5

Garrison Facilities	Requirement
Fuel Storage (gallons)	50,000
Brigade Offices (sf)	40,000
Battalion Offices (sf)	36,000
Company Offices (sf)	150,000
Unit Storage Buildings (sf)	20,000
Barracks Space (sf)	150,000
Military Vehicle Parking (sf)	800,000
Vehicle Maintenance Shop (sf)	50,000

Range Construction: All range upgrades discussed in Scenario 3 would take place. Additional firing points, from which 155 artillery and MLRS could fire munitions into the impact areas, would be sited at DTA and FWA.

Live Fire Training: Live fire training activities of the Fires Brigade would primarily involve many of the same small-arms and crew served weapons qualifications discussed under scenario 3, with individual (pistols, rifle and light machine gun) weapons and crew served weapons qualification with heavy machine guns. Firing activities would be conducted on existing qualification ranges and upgraded ranges on FWA. In comparison to the 1/25th IBCT and other units currently stationed at Fort Richardson, additional Fires Brigade Soldiers would increase existing live fire requirements on qualification ranges by 25-40%.

In addition to small arms qualifications, however, units of the Fires Brigade, including a battalion of 155 mm howitzer artillery pieces and Multiple Launch Rocket System (MLRS) Artillery would conduct firing activities into the impact area at Donnelly training area. These systems would

1 elevate the risk of potential wildfire, the level of explosive residue contamination in the impact
2 area and produce more noise. Firing would take place from dozens of firing points to which
3 artillery units would maneuver before firing into existing impact areas.
4

5 **Maneuver Training:** Fire Brigade units stationed under this scenario would participate in small
6 unit (platoon and below) maneuvers at FWA, AK. These units would support combat units
7 during Combined Arms Live Fire Exercises (CALFEX) and maneuver training rotations at
8 Donnelly Training Area and other USAG Alaska maneuver areas. Field artillery units stationed
9 under this stationing scenario would be anticipated to execute about 25-30 percent of their
10 maneuver training at FWA as small units and the remainder during large-scale maneuver
11 training rotations within the boundaries of USAG Alaska training areas. The total increase in
12 maneuver impact would be anticipated to be 20-40% over what currently takes place on Fort
13 Wainwright's small unit maneuver training areas. While Fires Brigade units are supporting
14 combat units and executing small unit maneuvers, both on and off-road maneuver would be
15 required.
16
17

4.8.2 Fort Wainwright Affected Environment and Environmental Consequences

This section discusses the existing baseline conditions for each environmental resource as well as the anticipated consequences to FWA should the Army implement one of the stationing scenarios discussed in Chapter 4.8.1.

4.8.3 Air Quality

4.8.3.1 Affected Environment

“The climate in Fairbanks is conditioned mainly by the response of the land mass to large changes in solar heat received by the area during the year. The sun is above the horizon from 18 to 21 hours during June and July. During this period, daily average maximum temperatures reach the lower 70s. Temperatures of 80 degrees or higher occur on about 10 days each summer. In contrast, from November to early March, when the period of daylight ranges from 10 to less than 4 hours per day, the lowest temperature readings normally fall below zero quite regularly. Low temperatures of -40 degrees or colder occur each winter. The range of temperatures in summer is comparatively low, from the lower 30s to the mid 90s. In winter, this range is larger, from about 65 below to 45 degrees above. This large winter range of temperature reflects the great difference between frigid weather associated with dry northerly airflow from the Arctic to mild temperatures associated with southerly airflow from the Gulf of Alaska, accompanied by chinook winds off the Alaska Range, 80 miles to the south of Fairbanks. In some months, temperatures in the uplands will average more than 10 degrees warmer than Fairbanks. During summer, the uplands are a few degrees cooler than the city. Precipitation in the uplands around Fairbanks is heavier than it is in the city. Fairbanks exhibits an urban heat island, especially during winter. Low lying areas nearby, such as the community of North Pole, are often colder than the city (National Climate Data Center, <http://climate.gi.alaska.edu/Stations/Interior/Fairbanks.html>).”

During winter, with temperatures of -20 degrees or colder, ice fog frequently forms in the city. Cold snaps accompanied by ice fog generally last about a week, but can last three weeks in unusual situations. The fog is almost always less than 300 feet deep, so that the surrounding uplands are usually in the clear, with warmer temperatures. Visibility in the ice fog is sometimes quite low, and this can hinder aircraft operations for as much as a day in severe cases.

While historically some problems associated with ice fog were generated at Fort Wainwright (FWA), a military construction project to replace the power plant's cooling ponds with air-cooled condensers was completed in 2007. Implementation of this new design has eliminated the generation of ice fog from the power plant.

FWA is located within the Northern Alaska Intrastate Air Quality Control Region. The installation is in attainment for all criteria pollutants; however it is classified as a major facility within the existing maintenance area for Carbon Monoxide (CO) because it is within the boundary of the former Fairbanks North Star Borough CO non-attainment area. As a result, proposed federal actions must undergo a general conformity review. FWA is also classified as a Prevention of Significant Deterioration (PSD) Major Facility because it has the potential to emit >250 tons of at least one regulated pollutant. Fort Wainwright (the cantonment area) is currently classified as a major stationary source under the following sections of the Clean Air Act (CAA): the Title I (Part D) Nonattainment New Source Review (NSR) and Title I (Part C) PSD programs; Section 112 air toxics program; and the Title V Operating Permit program.

FWA has a variety of air emission sources ranging from large, stationary boilers to smaller emergency generators, and prescribed burning (coordinated through BLM).

FWA possess 12-months of PSD-quality monitoring data, collected in 2003 from two monitoring stations situated within the cantonment area. There were no recorded violations of National Ambient Air Quality Standards (NAAQS) during the 12-month monitoring period. A table listing federal NAAQS is found in chapter 4.7-5 (FRA Air Quality).

Donnelly Training Area (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. DTA is covered under the Title V permit.

4.8.3.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant Adverse).

Cantonment Construction. These scenarios would involve the demolition of some facilities and construction of new facilities within the existing cantonment area. Construction related impacts would be temporary and would include an increase in dust mobile source emissions from construction vehicles and limited demolitions activity.

Long-term effects from stationing these units at FWA would include an increase in stationary source emissions such as from boiler units and generators used in new facilities and by units using transportable generators during training operations. The use of this equipment may require FWA to apply for a major or minor air quality permit through the Alaska Department of Environmental Conservation (ADEC).

These stationing scenarios would add POVs and 200-300 additional fleet vehicles (tactical and non-tactical vehicles that would require an additional maintenance facility. Additional vehicles would contribute to air pollutants (for example CO and ozone (O₃)) in the vicinity of FWA's cantonment area.

If this stationing scenario is selected, 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. Air conformity determination may be required.

Training Range Infrastructure Construction. Short-term effects would occur. Construction vehicles involved with some range expansion would cause soil disturbance that may generate fugitive dust leading to additional air quality impacts. Fugitive emissions and dust generated from expansion of ranges would affect the areas adjacent to ranges, but are likely to be contained within the range area. Best management practices would be used to mitigate fugitive dust emissions during construction. Short-term effects from the added use of generators and from construction vehicles would occur. Follow-on effects would be generated during training events as units utilize generators.

Live-fire Training. Localized emissions from the increase in live-fire from small arms weapons firing would add to the emissions on ranges. Air emissions from firing qualifications are released at the firing point; however, data published by the EPA indicates emissions from

weapons fire is relatively minor (www.epa.gov/ttn/chief/ap42/ch15/index.html, n.d.). Rifles and Machine Guns generally have very low emissions rates.

Live-fire activities may also increase the risk of wildfires, which may create short-term adverse impacts to air quality. Fires can add Carbon Monoxide (CO), Particulate Matter (PM₁₀ and PM_{2.5}), and Polycyclic Aromatic Hydrocarbons (PAH), 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 Training. These scenarios would involve an increase in maneuver activities by about 10 to 20 percent. Smaller unit maneuvers would continue to be supported at FWA, while Company-level and above would be supported at DTA, TFTA, and YTA. Vehicles associated with CSS or CSS 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 O₃.

In addition, CS 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 USAG Alaska Integrated Training Area Management (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.

Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant Adverse).

Cantonment Construction. Fort Wainwright does not have an adequate amount of vacant space within the existing cantonment area to accommodate more than 1,000 Soldiers. Cantonment construction would occur in two primary locations outside the existing cantonment area, to the north and to the southeast as required. Impacts from new construction would include dust generated from the construction areas resulting in increased opacity during the construction timeframe. There would also be a temporary increase in mobile source emissions from construction vehicles, and stationing sources from the use of generators and smaller equipment. The use of this equipment may require FWA to apply for a major or minor air quality permit through the ADEC. The installation would undergo general air quality conformity review and potentially a determination which could involve modeling of air quality impacts, if determined to be necessary.

Long-term effects from stationing these units at FWA would include an increase in stationary source emissions such as from boiler units and generators, or the possible extension of utilidors to new facilities. The increased steamload or coal consumption at the installations power plant would add to the installation's overall air pollutant emissions. The use of this equipment would likely require FWA to apply for a minor or major permit with the ADEC.

Implementing these stationing scenarios would increase the Soldier and Family population at FWA by 25 to 50 percent. This increase would mean an increase of 2,000-4,000 more privately owned vehicles operating at FWA and in the Fairbanks region. In addition, between 400 (Fires Brigade) and 900 tactical vehicles would accompany units under these stationing scenarios resulting. Vehicle emissions would contribute to air contaminants such as CO, O₃, NO_x, and

SOx, primarily within the cantonment area. Areas of elevated emissions may occur around installation motorpools and the installation cantonment area.

Training Range Infrastructure Construction. Short-term effects would occur. As with the 1,000 Soldier stationing scenario, most existing range infrastructure could accommodate training, some ranges needing only minor expansion; however FWA would need to construct an additional Modified Record Fire (MRF) Range while conducting upgrades to existing rifle, pistol and machine gun qualification ranges. Under these stationing scenarios, construction vehicles would operate more frequently on a short-term basis. Construction vehicles would cause soil disturbance that would result in the generation of fugitive dust. Fugitive emissions and dust generated from expansion of ranges could affect the areas adjacent to ranges, but would mostly be contained within the range area. Best management practices would be used to mitigate fugitive dust emissions during construction. Short-term effects from the added vehicle emissions and the use of small generators would occur.

Live-fire Training. Live-fire ranges would be utilized more frequently and by more Soldiers. Vehicle emission would be generated en-route to live-fire ranges and in the parking areas. Emissions from weaponry would increase, but generally would not result in any degree of significance as indicated by EPA AP42 studies (www.epa.gov/ttn/chief/ap42/ch15/index.html, n.d.). Rifles and Machine Guns generally have very low emissions rates and the impacts of firing more small arms rounds on facilities designated for this activity are not anticipated to have detectable effects in regard to air quality emissions from firing of weapon systems.

The increase in live-fire activities could also increase the risk of igniting wildfires. The emissions generated from wildfires can be significant and could be experienced at great distances from the source if the fire is not immediately managed. FWA's wildfire management programs and mitigations would continue.

Live-fire ordnance and artillery training associated with the Fires Brigade would occur at DTA. These activities would cause an increase in particulate matter in a localized area within the existing impact area at DTA.

Maneuver Training. These scenarios would involve an anticipated 20-40% increase in maneuver activities for a Fires Brigade or 30 to 60 percent increase for 3,000 additional CS or CSS Soldiers. These units would also utilize the Tanana Flats Training Area (TFTA), Yukon Training Area (YTA), and Donnelly Training Area (DTA) for a majority of their maneuver training. The increased training would occur primarily on roads, trails, or hardened surfaces for CSS units. CS units and the Fires Brigade would conduct off-road maneuvers when training. In addition to vehicle emissions, maneuver would increase the occurrence of fugitive dust and opacity; however these effects are anticipated to be localized to the range area.

The increase in off-road maneuvers would denude soils of vegetation and could increase opacity and fugitive dust, though fugitive dust problems are currently not a major issue within USAG Alaska maneuver training areas and are limited due to wet conditions. Air quality effects from maneuver training are anticipated to be contained within existing maneuver areas. Stationing scenarios would not be anticipated to increase the frequency of large unit maneuver rotations at DTA, TFTA, or YTA, and existing installation programs like ITAM would be expected to limit loss of vegetative cover and any subsequent air quality issues from maneuver training.

Donnelly Training Area

CS (1,000), CSS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Live-fire Training. Live-fire associated with this stationing scenario may have long-term impacts. Air emissions would be emitted at the firing points where small arms are fired, and from vehicles used during training exercises. Vehicle emissions would contribute to air contaminants such as CO, O₃, NO_x, and SO_x. Emissions at the firing point would be generated from small arms. Rifles and Machine Guns used on qualification training ranges have very low emissions rates and these emissions are generally dispersed quickly (depending on wind speed and direction).

Live-fire activities may also increase the risk of wildfires, which may create short-term adverse impacts to air quality. Fires may also occur in the ordnance impact area at DTA. Access to the impact area could limit the response of fire crews; however, the installation employs the use of prescribed burns and other mitigations to minimize these effects.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area**CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).**

Maneuver Training. Long-term effects are expected. Vehicles associated with CSS or CSS, or field artillery 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 O₃. These levels of Soldier growth would add approximately 25 to 50 percent more vehicle emissions to the training areas as a whole.

In addition, CS units and Field Artillery 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 increase opacity and fugitive dust within the range area.

Fugitive emissions from road, trail, and range maneuver do not generally travel outside the training area boundaries.

Only short-term, intermittent minor impacts from mobile source emissions are expected along roadways during convoy between the Soldiers' home station (whether at FRA or FWA), and on roads and trails. The emissions from vehicles traveling on highways would be dispersed over a wide area.

4.8.4 Airspace**4.8.4.1 Affected Environment**

Aviation is an essential component of transportation in the Fort Wainwright region and across the state of Alaska. The civilian aviation community utilizes Fairbanks International Airport as well as numerous smaller airfields within the region. FWA has its own 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 most military aircraft. Ladd Army Airfield has one active runway; several ancillary taxiways, and hangars. The airspace surrounding Ladd Army Airfield is classified as Class D.

Yukon Training Area has special air-space limits that extend from 100 feet to 17,999 feet above mean sea level (amsl). The training area also contains MOAs that extend from 500 to 10,000 feet and 10,001 to 17,999 feet amsl. There is restricted airspace over YTA that covers the eastern portion of the training area and the Stuart Creek Impact Area. The remaining restricted airspace extends from the ground surface to 20,000 feet amsl.

Tanana Flats Training Area is under an MOA with Eielson AFB that extends from 100 to 17,999 feet amsl. Restricted airspace overlays the southern portion of TFTA.

At DTA, Special Use Airspace limits range from 300 feet amsl to 6,999 feet amsl. Most of DTA West is within the Restricted Area. The areas are closed to all civilian aviation during periods of scheduled activity. Nearby Allen Army Airfield is capable of supporting C5/C141 aircraft in winter and C130 aircraft at all other times. There is also a small unpaved light aircraft landing strip north at Delta Junction.

Two civilian flight corridors have been established. One is along the Alaska Highway near Delta Junction and the other is along the Richardson Highway near Donnelly Dome. These corridors, which extend from ground surface to 3,500 feet amsl, were established to maintain civil aviation access along major VFR flyways along the Alaska Highway, Richardson Highway, and the Trans-Alaska Pipeline. Both the corridors are highly used for civil aviation. For example, the corridor along the Richardson Highway leads to Isabel Pass, which is one of two passes through the central Alaska Range between Fairbanks and south-central Alaska. Civilian air traffic primarily uses Isabel Pass because of its higher probability of favorable weather conditions.

4.8.4.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (No Impact).

Cantonment Construction. Construction at FWA is not expected to require modifications to controlled or special use airspace. Therefore, no additional affects are expected.

Training Range Infrastructure Construction. The various range expansion projects that would be required to support any of these stationing scenarios (respectively) would not require modifications to controlled or special use airspace, as the modifications would involve small arms ranges already located within special use airspace. Therefore, no additional affects are expected.

Live-fire Training. Training would generally involve the use of small arms ranges for all stationing scenarios. Range expansion or construction would not result in the need to modify existing airspace designations at FWA.

Maneuver Training. Maneuver training of these ground-based units will have no effect to airspace at FWA. Airspace is not required to accommodate nonlive-fire, ground-based maneuvers.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Training Range Infrastructure Construction. No additional range construction may be required under CSS or CS stationing scenarios. However, additional firing points (accommodating the Fires Brigade) may be added near the impact area. Construction would not involve any modifications to airspace; therefore, no additional effects are expected.

Live-fire Training. The CS and CSS stationing scenarios would not require additional ranges at DTA; therefore they would continue to operate under current CFAs. 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. The frequency of Soldiers training on live-fire ranges at DTA would increase thereby further restricting access to airspace to the public during live-fire exercises. The percentage of additional annual airspace time needed may be between 15 and 60 percent.

Field artillery live-fire training would occur at DTA. The training area would experience additional use of the 105mm and 155mm munitions being fired into DTA impact areas. Further, the Fires Brigade may employ the use of the High Mobility Artillery Rocket System (HIMARS) launcher, multiple launch rocket system. HIMARS fires the M26 Tactical Rocket (firing 644 submunitions over a 0.23 km² area) that has a maximum range of 32 km; the M28A1 Reduced Range Practice Rocket with a range of 8-15 km; the M26A1/M26A2 Extended Range Rocket (ER-MLRS) that contains 518 submunitions and has a maximum range of 45 km; the XM30 Guided MLRS Rocket that has a range of 60 km and carries a payload of 400+ grenades; and the Guided MLRS Unitary Rocket, a rocket containing High Explosive (HE) that has a maximum range of 60 km (HIMARS Acquisition Status Sheet, February 2008). Additional use of these systems may result in reduced public access to the training area during live-fire activities; and may require the modification of restricted airspace to accommodate this weapons system.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (No Impacts).

Maneuver Training. Maneuver training of these ground-based units will have no effect to airspace at FWA. Airspace is not required to accommodate nonlive-fire, ground-based maneuvers.

4.8.5 Cultural

4.8.5.1 Affected Environment

The prehistory of interior Alaska is characterized by a varied, often nomadic settlement pattern with a focus on hunting of terrestrial animals. The Paleoarctic and Northern Archaic tool traditions included stone, bone, antler, and ivory tools. The lithic technologies included the use of microblades. With the Athabascan Tradition, materials culture begins to reflect distinct cultural groups.

In the late Pleistocene, the interior of Alaska was a relatively ice-free bowl surrounded by the extensive continental ice sheet to the east and the Cordilleran glacier to the west. The Alaska Range forced storm systems from the south upwards creating a rain shadow and a broad, ice-

1 free, steppe-tundra environment to the north. This environment supported large herbivores such
2 as bison, mammoth, mastodon, horse, camel, moose, caribou, antelope, elk, and yak. Most of
3 the earliest evidence of human occupation in Alaska is found in the interior. The first humans
4 could have crossed from Asia into Alaska as early as 30,000 BP, but the earliest known sites in
5 the interior date from 11,000 to 12,000 BP.

6
7 Paleoarctic Tradition sites (12,000 to 6,000 BP) are typically camps on terraces, buttes, and
8 bluffs or other high ground from which they could locate and track large mammals, such as
9 bison and mammoth, in the treeless environment. The nomadic lifestyle of these groups, the
10 perishable organic materials that they used, and subsequent environmental changes have
11 made it difficult to find traces of their cultures. This tradition includes the Denali Complex and
12 the Chidadn Complex. The Denali Complex includes distinctive microblade cores, core tablets
13 and their derivative microblades, large blades, biconvex bifacial knives, certain end-scrapers
14 forms, and burins. The Chidadn Complex is characterized by Chidadn points, and bifacially
15 flaked triangular or teardrop shaped projectile points.

16
17 The Northern Archaic Tradition (6,000 to 1,000 BP) was an adaptation to expanding boreal
18 forests. Settlement patterns and the range of terrestrial animals exploited were more varied in
19 this period. The hallmark of the Northern Archaic Tradition is the presence of side-notched
20 points.

21
22 The Athabascan Tradition (2,000 to 150 BP) begins to exhibit distinct traits of subgroups within
23 general geographic areas. These traditions develop into the historic subgroups of the region.
24 The Athabascan Tradition includes a reorganization of raw materials, which de-emphasized
25 stone tool making and increased the emphasis on the manufacture of items from native copper
26 and organic materials.

27
28 History. Interior Alaska's history is divided into four historic themes according to the types and
29 levels of Euro-American activities. These are the Early Contact history (1810s to 1880s), Gold
30 Rush (1880s to 1928), Development of Infrastructure (1890s to 1910s), and Military Activities
31 (1890s to present); these are discussed below.

32
33 Early Contact: First contact between the Athabascan and European cultures probably
34 commenced with trade goods from Russian fur trading posts on the Copper and Yukon Rivers
35 and a British trading post established where the Porcupine River joins the Yukon River in 1847.
36 Contact between Tanana Athabascans and white traders increased steadily in the 1860s.
37 Several village sites associated with the early contact period have been reported near the Fort
38 Wainwright Main Post, two just northwest of the fort's boundary and one near Fairbanks. With
39 the U.S. purchase of Alaska in 1867, control of the trading stations fell to the Americans, and
40 American traders established new posts on the Yukon and Tanana Rivers. Natives became
41 increasingly exposed to trade and established permanent settlements.

42
43 Gold Rush: Gold discoveries in 1886 and 1894 northeast of Fairbanks led to an influx of Anglo-
44 American settlements in the Tanana Valley. The first settlers established themselves in the
45 Tanana Valley in the 1890s. A trading post was established at Chena in 1900, and another was
46 established by E. T. Barnette at the future town site of Fairbanks in 1902. Further gold
47 discoveries in 1902 and 1903 near Fairbanks led to a dramatic increase in the town's population
48 to 15,000 in 1909. Most of the mining activity occurred on creeks north of Fairbanks, and no
49 workings associated with early mining have been found in the in DTA. Cabin remains, sites, and
50 trails from the Gold Rush period have been identified.

1 Development of Infrastructure: The initial means of transport to interior Alaska was by riverboat
2 along the Yukon River to the Tanana River, either upstream from St. Michael or downstream
3 from the White Pass and Yukon railhead at Whitehorse in Canada. An overland trail was
4 established in by the U.S. Army 1899, from Valdez to Eagle, and later to Fairbanks. The original
5 Valdez to Fairbanks Trail crossed the Main Post and followed what is now Gaffney Road.
6 Portions of the trail were upgraded to a wagon road and an automobile road over the years.
7 Roadhouses were established along the route to cater to the travelers. Traces of several of
8 these roadhouses have been identified including Gordon's Roadhouse and Sullivan's
9 Roadhouse on Fort Greely (DTA). The Alaska Railroad was later completed, linking Fairbanks
10 to Anchorage.

11
12 Military Activities: Military aviation activities began in the Fairbanks area in 1913. The town
13 became the aviation hub for interior Alaska by 1928. Federal legislation in 1935 and 1937
14 established Ladd Airfield near Fairbanks, which became the home of the Cold Weather
15 Detachment in 1940. Ladd Field was affected by World War II, following Japan's invasion of the
16 Aleutian Islands in June 1942. The facilities at Ladd Field expanded rapidly due to increased
17 activities of the Sixth Air Depot Group, the Cold Weather Test Station, and the Air Transport
18 Command. Auxiliary bases were established to assist Ladd Field with the traffic of the Alaska-
19 Siberia Lend-Lease Program between 1942 and 1945, including Big Delta (Fort Greely). After
20 the formation of the U.S. Air Force in 1947, Ladd Field was designated Ladd Air Force Base.
21 However, the Army's mission at Ladd Field continued, with anti-aircraft and ground defense and
22 cold-weather testing and training. The Army's cold-weather testing and training missions shifted
23 from Ladd Field to the Arctic Training Center at Fort Greely, including Donnelly Flats, in the mid-
24 1950s. Construction at Fort Greely in the 1950s included the military's first nuclear power plant.
25 In 1961, the U.S. Air Force transferred Ladd Air Force Base to the Army, which was then
26 renamed Fort Jonathan Wainwright. With the introduction of the Intercontinental Ballistic Missile
27 in the 1960s, Fort Wainwright's anti-aircraft mission diminished, and the post's primary mission
28 became peacetime Army deployment. In the 1970s, Arctic training, including exercises at Fort
29 Greely began to be emphasized. In 1986, the 6th Infantry Division (Light) was activated at Fort
30 Wainwright to function as a rapid deployment force.

31
32 Known sites in interior Alaska have been identified predominantly through discoveries by area
33 residents and road construction crews, and other chance discoveries. Consultation with
34 Alaskan Native Tribes to identify Traditional Cultural Properties (TCP's) or other sites of cultural
35 or sacred significance has been on-going. Multiple contracts with Alaskan Native communities
36 are in the process of being conducted, but currently no TCP's or other cultural resources have
37 been identified. Due to the sensitive nature of such consultation and the need for continued
38 outreach and trust-building with Alaskan Native Tribes, these continue to be conducted.

39
40 Archaeology: The basic cultural context for interior Alaska sites is found in the Integrated
41 Cultural Resources Management Plan (ICRMP). Management of these resources include
42 FWA's main post and each of the training areas.

43
44 FWA Main Post: Archaeology. Twelve archaeological surveys have been conducted on FWA
45 Main Post. These surveys have either focused on high potential areas of Fort Wainwright, or
46 have been related to construction projects. Survey sites include the southern slopes of Birch
47 Hill, various borrow sources south of the cantonment area, and small arms ranges between the
48 Richardson Highway and the Tanana River. As a result of the surveys, nine archaeological sites
49 have been identified on FWA Main Post, located north of Chena River and along the southern
50 slopes of Birch Hill. Four sites of the nine sites have been evaluated for eligibility for inclusion in

the National Register, and were determined not eligible. The remaining five sites have not been evaluated to date.

Tanana Flats Training Area: Five archaeological surveys have been conducted in the TFTA starting 1973. Survey sites include Blair Lakes, CC Buttes, WR Buttes, Blair Lakes Range, and the Alpha Impact Area. As a result, fifty sites have been identified and two archaeological districts have been designated. A third archaeological district exists in the vicinity of Wood River Buttes. Of the sites identified, thirteen have been determined eligible for inclusion in the National Register of Historic Places, twenty-eight have been determined not eligible, and eight are pending or remain to be evaluated for eligibility. If the Tanana Flats are used for military operations, the areas that will be potentially impacted would be subject to archaeological inventory. Previous surveys conducted in the Tanana Flats would be used as a research tool to better understand the potential archaeology in the area. The majority of the areas that were surveyed should be resurveyed due to the amount of time that has passed -- over 30 years for some areas. Due to its remote setting, the archaeology of the TFTA is not well understood and represents a gap in USAG Alaska's current inventory of archaeological and cultural sites.

Yukon Training Area: Nine archaeological surveys have been conducted on YTA. As a result, fourteen archaeological sites have been identified. Of these, twelve sites have been determined not eligible for listing in the National Register of Historic Places. One location has not been evaluated due to its location in a heavily used portion of the Stuart Creek Impact Area. A determination of eligibility on the final location is pending further fieldwork.

Donnelly Training Area: Since 1963, twenty-three archaeological surveys have been conducted in the DTA. As a result, 358 sites have been found. Fourteen of these sites make up two archaeological districts. Sixty sites have been evaluated and 25 of these are eligible for listing on the National Register of Historic Places. Of the sites evaluated at DTA, the majority of them have been limited to DTA East, specifically the portion of DTA East on the Delta River. DTA East comprises only about 25 percent of the land on DTA. Due to the remote setting, the archaeology of DTA is not well understood.

Architectural Surveys. In 1984, the entire FWA main post was inventoried and evaluated for eligibility for inclusion in the NRHP under the World War II and Cold War historic contexts. Under the WWII context, Ladd Field has been designated as a National Historic Landmark. This area includes thirty-seven buildings and structures.

Under the Cold War context the main post has been identified and determined eligible for inclusion in the NRHP; however it has not been formally nominated for listing. In that area, there are seventy buildings and structures identified as contributing to the Ladd Air Force Base Historic District. In 2000, USAG Alaska developed a Cold War context for Ladd Air Force Base and based on this study, all buildings on FWA were evaluated under this context (USAG Alaska 2004). The SHPO currently is requesting additional buildings to be considered under additional themes.

A survey of range structures in the TFTA was conducted in 2001 and none were evaluated as eligible for listing on the NRHP (Price 2001).

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.

Early mining studies indicated that no significant mining activities occurred at YTA. The Pine Creek mining complex in the northeastern corner of the training area was listed as a potential historic property; however, based on an early mining study (Neely 2001) that site is not eligible for listing in the NRHP.

Systematic investigations in the DTA area began with site investigations around Donnelly Ridge in 1964. In the 1970s, several studies involved a pipeline route and upgrades on Fort Greely. Less than 1 percent of the DTA had been systematically surveyed prior to the FEIS. Twelve surveys were conducted on DTA. Through these surveys, 105 known sites were recorded. Eighteen of the sites are recommended eligible for the NRHP, 56 need to be evaluated, and 31 are recommended not eligible.

24 archaeological surveys have been conducted on DTA since 1963 identifying approximately 400 sites. Between 1960 and 2001 16 surveys were conducted that resulted in the identification of 107 sites. USAG Alaska began archaeological surveys of large blocks, particularly in DTA East, in 2002. In contrast to earlier surveys, these block surveys covered entire areas and employed an aggressive sub-surface testing strategy (Robertson et al. 2006). Robertson et al. 2006 lists 52,617 acres of new archaeology surveys on DTA between 2002 and 2005. This is approximately a tenfold increase in the percentage of land surveyed on DTA, but still encompasses a small portion of DTA. 293 new sites have been identified and 110 of the new sites have been evaluated for eligibility for listing in the NRHP.

4.8.5.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant but Mitigable).

Cantonment Construction. Construction supporting these stationing scenarios could potentially disturb or damage cultural resources, or could alter properties and districts. Infill construction in the main post may require the demolition of barracks to make room for new construction within FWA's current Historic District. Section 106 consultation would be required. Any construction occurring at the borders of the designated historic district within the main post area may require additional consultation. Depending on the size of the facilities needed, the SHPO may need to be involved in the design process to minimize potential impacts. All construction under these scenarios would occur on previously disturbed ground and no other cultural resources have been identified within the installation's main post.

Training Range Infrastructure Construction. Construction equipment would involve grading/re-grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the subsurface. Expansion of some ranges would be required. Although range expansion projects would be located on previously disturbed ground, construction activities have the potential to result in damage to undocumented cultural resources.

Live-fire Training. No effects are anticipated. Range expansion and new targetry would be sited to avoid cultural resources at FWA following identification of these sites during cultural resource surveys. Live-fire activities would not have a significant impact to cultural resources. The installation also has an established Integrated Cultural Resources Management Plan (ICRMP) that would be closely followed by military personnel.

1 *Maneuver Training.* The frequency and intensity of maneuver training would increase under
2 these stationing scenarios. Under these scenarios, no new maneuver areas would be required
3 and all maneuver training would be conducted in the footprint of existing ranges and trails at
4 FWA. However, undocumented cultural resources currently not identified could be impacted
5 through maneuver training discussed in these scenarios. Stationing scenarios involving CS
6 units, particularly engineer or combat engineer units, may involve some surface excavation,
7 which could potentially uncover or damage undocumented cultural resources.
8
9

10 **Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).**
11

12 *Cantonment Construction.* Similar to the 1,000 Soldier stationing scenarios, construction
13 supporting these stationing scenarios could disturb or damage cultural resources, or could alter
14 properties and districts. Any construction occurring at the borders of the designated historic
15 district may require Section 106 Consultation. Construction supporting these stationing
16 scenarios would likely occur north of the river and at the southeast corner of the main post.
17 Surveys have been conducted across the river north of the hospital and south of the landfill.
18 Some archaeological sites are present but are not eligible. Additional surveys may be needed
19 in the area identified for potential Family housing construction (Figure 4.8-2).
20

21 *Training Range Infrastructure Construction.* Construction equipment would involve grading/re-
22 grading site surfaces, grubbing vegetation, and using heavy equipment to excavate the
23 subsurface. As with the 1,000 Soldier scenarios, expansion of some ranges would be required.
24 These range expansion projects would be located on previously disturbed ground; however,
25 construction activities have the potential to result in damage to undocumented cultural
26 resources. New ranges could be sited in an area to the south of the railroad tracks. New
27 construction would occur within the footprint of existing ranges or previously disturbed ground.
28 New ranges would be sited to avoid known cultural resources.
29

30 *Live-fire Training.* No effects are anticipated. Range expansion and new targetry would be
31 sited to avoid cultural resources at FWA following identification of these sites during cultural
32 resource surveys. Live-fire activities would not have a significant impact to cultural resources.
33 The installation also has an established Integrated Cultural Resources Management Plan
34 (ICRMP) that it utilizes to ensure the protection and preservation of cultural resources.
35

36 *Maneuver Training.* The frequency and intensity of maneuver training would increase under
37 these stationing scenarios. Under these stationing scenarios, no new maneuver areas would be
38 required and all maneuver training would be conducted in the footprint of existing ranges and
39 trails at FWA. Stationing scenarios involving CS units, particularly engineer or combat engineer
40 units, may involve some surface excavation, which could potentially uncover or damage
41 undocumented cultural resources. If cultural resources are discovered, USAG Alaska cultural
42 resources managers will implement procedures to notify the SHPO and follow procedures
43 designated in the ICRMP.
44
45

46 **Donnelly Training Area**
47

48 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than**
49 **Significant).**
50

1 *Training Range Infrastructure Construction.* No range construction is anticipated with the CS or
2 CSS stationing scenarios. Existing facilities at DTA would continue to meet semi-annual
3 training requirements for these units.
4

5 Construction of new firing points to accommodate the Fires Brigade may be required.
6 Construction equipment would involve grading/re-grading site surfaces, grubbing vegetation,
7 and using heavy equipment to excavate the subsurface. These activities have the potential to
8 result in damage to cultural resources. DTA is rich in archaeological and cultural resources and
9 continues to conduct surveys on its lands; however, the areas where range construction may
10 occur (yet to be identified) is likely to be highly disturbed. Garrison Cultural Resources
11 personnel would ensure proper siting of new firing points to avoid any documented sites, or
12 conduct further evaluation if necessary.
13
14

15 **Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area**

16

17 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).**
18

19 *Maneuver Training.* Maneuver training may impact cultural resources. Maneuver training is
20 restricted to prevent impacts to known cultural resources sites. No new maneuver areas would
21 be required to support these stationing scenarios. Maneuver training under all scenarios would
22 be conducted in the footprint of the training installations. However, new cultural resources sites
23 currently not identified could be impacted through maneuver training discussed in these
24 scenarios. Stationing scenarios involving CS units, particularly engineer or combat engineer
25 units, may involve some surface excavation, which could potentially uncover or damage
26 undocumented cultural resources.
27
28
29

30 **4.8.6 Noise**

31 **4.8.6.1 Affected Environment**

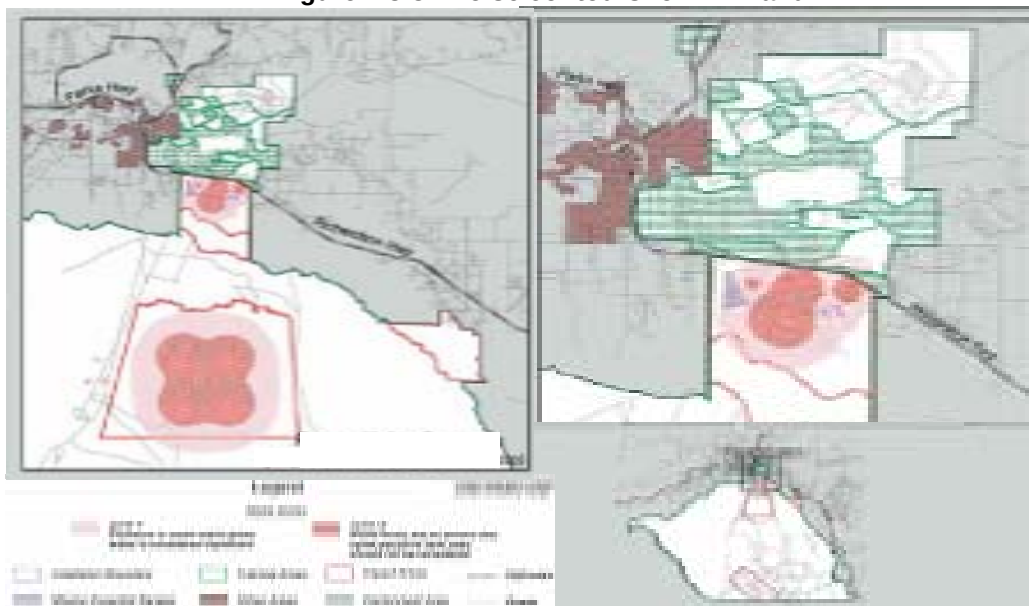
32

33 The existing noise environment for FWA including YTA, TFTA, and DTA is documented in the
34 Fort Wainwright Installation Environmental Noise Management Plan. The more common
35 sources of noise at interior Alaska sites are from traffic, aircraft, and large and small caliber
36 weapons firing. FWA receives few complaints from the surrounding community each year. The
37 more common responses from the public to military activities involve questions regarding the
38 source of noise, and when the installation expects those noise events to cease. The number of
39 complaints has decreased as the installation staff began providing the public advanced notice
40 on training schedules.
41

For FWA and TFTA, NZ II and NZ III are both contained within the installation boundary. However, portions of the cantonment area are affected by NZs II. Figure 4.8-3 illustrates the noise contours at FWA and TFTA.

All NZs for TFTA are contained within the installation's boundary. This area is used primarily for Soldier maneuver (in the winter) and some demolitions activity and large caliber weapons firing into an existing impact area.

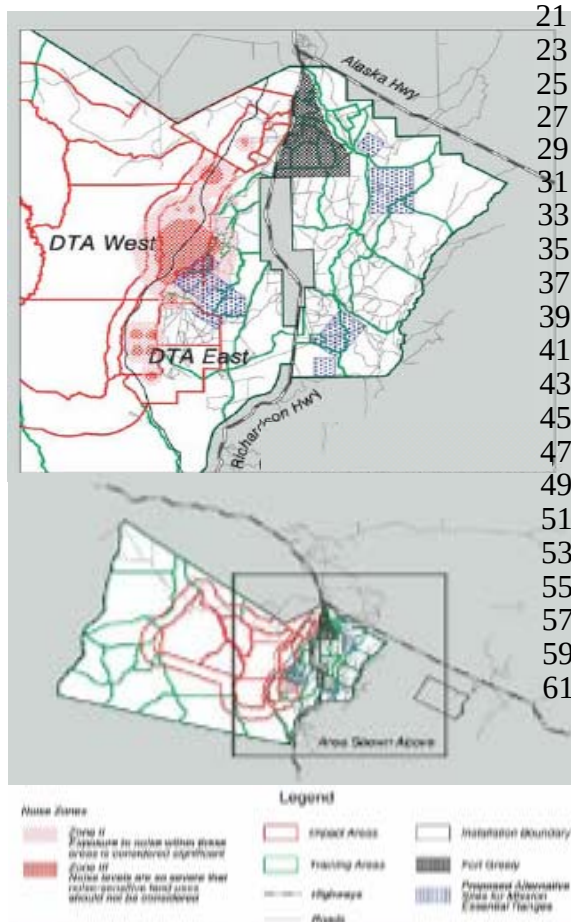
Figure 4.8-3. Noise contours for FWA and TFTA



Similar to TFTA, YTA generates noise from Soldier maneuver, demolitions, and artillery firing. Noise contours are located towards the center of the training area, more than four miles from the installation boundary. Figure 4.8-4 illustrates noise contours for YTA.

The general noise environment at DTA is associated with the operations of helicopters, artillery training, and bomb detonation. Other minor noise sources include but are not limited to construction, traffic, and recreation. Based on documented noise contours the noise generated from DTA generally stays within the boundaries of the installation. DTA receives only a few noise complaints from the public each year; to reduce these complaints and any burden to the public, the installation has altered some training schedules, has moved toward the use of newer and quieter equipment, and has begun providing the public advance notice of unusual sources of noise such as flight patterns or training that is not common to the installation. Figure 4.8-5 illustrates the noise contours at DTA.

Figure 4.8-4. Noise contours for YTA



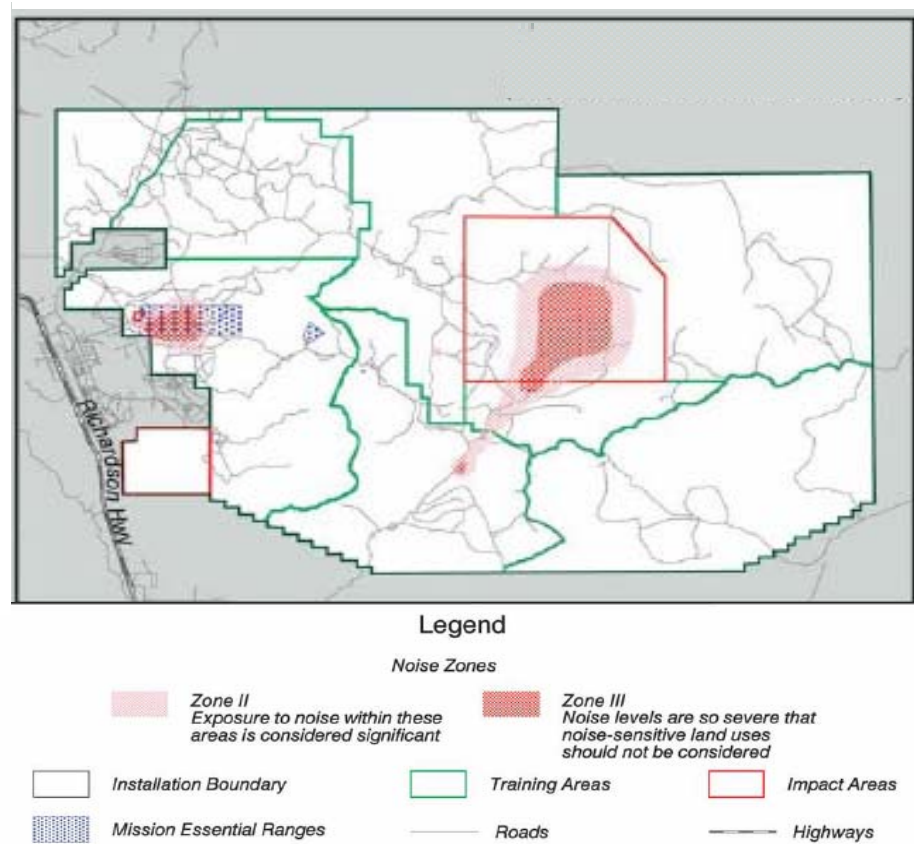


Figure 4.8-5. Noise contours for DTA

4.8.6.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Cantonment Construction. Impacts from construction would be temporary. Noise associated with construction would result mainly from the movement of vehicles and equipment. An assessment of specific impacts would be conducted upon final siting of facilities required to support these stationing scenarios.

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 Occupational Safety and Health Administration (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 would be discussed in Chapter 4.8.8 Biological Resources.

1 *Training Range Infrastructure Construction.* Similar to cantonment construction, range
2 construction and expansion would result from the movement of construction vehicles and
3 equipment. Significant effects are not anticipated to the public due to distance from expansion
4 locations to off-post communities. However, temporary noise impacts may occur to wildlife.
5 This would be discussed in Chapter 4.8.8 Biological Resources.
6

7 *Live-fire Training.* Long-term effects would occur. Although the same intensity of noise would
8 continue, stationing 1,000 or more Soldiers would increase the frequency of noise generating
9 events. The frequency of live-fire events that generate noise may increase by 15 to 60 percent
10 depending on the stationing scenario (10 to 20 percent for 1,000 Soldiers; 25 to 40 percent for
11 1,600 Soldiers; and 30 to 60 percent for 3,000 Soldiers). Because units will be using the same
12 weapons systems as are currently being used during live-fire training at the installation the types
13 of noise will not change; however, the number of noise generating events would increase.
14 Residential areas located in the vicinity of the range complex would experience an increase in
15 noise events by up to 60 percent depending on the stationing scenario.
16

17 The Fires Brigade would utilize different equipment but would train with artillery and ordnance at
18 DTA. Impacts to wildlife receptors at DTA could occur in areas that bison, caribou, moose, and
19 other wildlife frequently utilize. Firing points are in close proximity to bison calving areas and
20 prime moose browse areas as well. The stationing of a Fires Brigade could result in greater
21 disturbance to wildlife due to increased noise from live-fire training events. If decisions are
22 made to station a Fires brigade in Alaska, studies may be needed to characterize direct and
23 indirect impacts to wildlife.
24

25 *Maneuver Training.* Although there would be an increase in Soldiers maneuvering, the type of
26 noise would be consistent with ongoing maneuver activities. The increased frequency of noise
27 generating events would correspond to the increased maneuvers associated with these
28 stationing scenarios (10 to 60 percent).
29

30 Noise levels along on-post roadways and along military vehicle trails would increase. However,
31 overall traffic volumes and vehicle speeds generally are low for these types of roadways. As a
32 result, noise increments attributable to vehicle traffic would remain within the Army's land use
33 compatibility guidelines.
34

35 The noise effects that would be produced from convoy travel on public roads would be limited,
36 though they would have long-term intermittent effects. Vehicle convoys traveling between FWA
37 and interior Alaska training areas would increase in frequency. These effects are usually
38 mitigated through standard operating procedures for convoy maneuver. A convoy is normally
39 defined as six or more military vehicles moving simultaneously from one point to another under
40 a single commander, ten or more vehicles per hour going to the same destination over the same
41 route, or any one vehicle requiring a special haul permit. Convoys normally maintain a gap of
42 15 to 30 minutes between serials (a group of military vehicles moving together), 330 feet
43 between vehicles on highways, and 7.5 to 15 feet while in town traffic. These procedures are
44 followed to minimize the noise and traffic impacts to the public.
45

46 **Donnelly Training Area**

47 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than**
48 **Significant).**
49
50
51

Live-fire Training. Long-term effects are expected. Although the same intensity of noise would continue, stationing 1,000 or more Soldiers would increase the frequency of noise generating events. The frequency of live-fire events that generate noise may increase by 15 to 60 percent depending on the stationing scenario. However, noise contours would not change and the noise generated from these activities would continue to be contained within the boundaries of the installation. There may be some expected noise effects to wildlife from use of firing points along the Delta River where bison, caribou and moose are known to inhabit.

The Army will continue to communicate live-fire training operations with Delta Junction and local residences. There have been no significant impacts to these residences from noise in the past.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Maneuver Training. Although there would be an increase in Soldiers maneuvering in these areas, 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 60 percent). Noise levels along on-post roadways and along military vehicle trails would increase, but would remain within the Army's land use compatibility guidelines.

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 standard operating procedures for convoy maneuver.

4.8.7 Soil Erosion Effects

4.8.7.1 Affected Environment

USAG-AK 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 Integrated Training Area Management program conducts annual monitoring of soils and vegetation through the Range and Training Land Assessment program. Current and past disturbance resulting from military training and recreational use is delineated and quantified in terms of "land condition." Annual Range and Training Land Assessment reports detail the levels of disturbance and land condition on 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 storm water prevention techniques. Restoration of disturbed areas is conducted through installation management erosion control and streambank stabilization programs, as well as through the Land Rehabilitation and Maintenance program (USAG Alaska INRMP 2007 to 2011).

The soils at 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 United States). Swanson and Mungoven (2001) characterized the soils there based on their parent material properties,

1 consisting of alluvium, loess, and bedrock. The soil surface generally contains an organic layer
2 of peat (made up of decaying plant and animal matter) builds up on cold and wet soils and is
3 inhibited from decomposition because of colder temperatures for much of the year.

4
5 The installation's INRMP (2007 - 2011) indicates that the military impact is greatest on soil
6 productivity in the Main Post area due to construction. Soil disturbance has been minimally
7 found around small arms ranges, roads, and other facilities. However, the soils at Stuart Creek
8 Impact Area have been exposed to erosion as a result of military activities and construction.
9 Army activities have had limited impact on soils at FWA. Throughout the post, the presence of
10 permafrost allows a higher bearing strength to soils when they are frozen; but when those soils
11 have thawed they experience compaction problems and rutting which can increase sheet and rill
12 erosion. The presence of permafrost and loess works to inhibit drainage and may lend to a very
13 low bearing strength when those soils are thawed. In addition to the garrison's INRMP, detailed
14 information on the characterization of soils at FWA may also be found in the *Ecological Land*
15 *Survey for Fort Wainwright* (Jorgenson et al. 1999).

16
17 The soils at TFTA have been formed in various unconsolidated materials. These soils are
18 distributed in elongated meander scars and in broad basins. Generally, coarse gravel may be
19 found at the heads of alluvial fans where soils are well drained; and sand and silt can be found
20 at the base of alluvial fans where soils are poorly drained. The permafrost layer there may lie
21 approximately as low as 20 inches below the soil surface and may be as thick as 128 feet.
22 Permafrost is not present beneath the rivers and lakes there but generally exists where there is
23 an absence of surface water or circulating groundwater. TFTA is more frequently used for
24 maneuver training during winter because the presence of snow acts as a protective layer
25 against impacts to permafrost. TFTA has both continuous and discontinuous areas of
26 permafrost. The permafrost layer is susceptible to thermokarst as a result of disturbance of
27 surface soils and vegetation removal.

28
29 At YTA, the south slopes of mountains consist of soils that are well drained and composed
30 mainly of silt and loams (generally free of permafrost). Where the silt loams may be shallow
31 near ridge tops and mid-slopes, they may be deeper on lower slopes. The bottoms of
32 depressions have shallow gravelly silt loam covered with a thick layer of Peat underlain by
33 permafrost. YTA is located in a discontinuous permafrost zone there perennially frozen soils
34 are widespread. Permafrost there may be absent on hill tops and south-facing mountain slopes.
35 Similar to TFTA, areas of unfrozen ground lie beneath large waterbodies.

36
37 A comprehensive soil survey was completed for DTA in 2005. Glacial and alluvial processes,
38 as well as isolated discontinuous patches of permafrost, primarily formed soils in the DTA. The
39 NRCS has only mapped soils in the Main Post cantonment area, in which 12 soil associations
40 have been identified. Generally, soils at DTA are derived from glacial actions and modified by
41 streams and discontinuous permafrost. Soils in the northern, west-central, and eastern portions
42 of DTA are silt loam associations, while DTA East is predominantly shallow silt loam over
43 gravelly sand. Soils in the river floodplains consist of alternate layers of sand, silt loam, and
44 gravelly sand. Highly organic wet soils, underlain by permafrost, and having a high water table
45 characterize muskeg soils. Upland foothills have moist, loamy soils, while mountain soils are
46 rocky, steep, and unvegetated (USAG Alaska INRMP 2007-2011). Soils on river floodplains in
47 the DTA comprise alternate layers of sand, silt-loam, and gravelly sand. Floodplain soils are
48 known to have moderate erosion potential, while foothill soils have moderate to high erosion
49 potential. Permafrost is found in irregular patches throughout a large portion of the DTA,
50 particularly in morainal areas where slope and aspect change abruptly (Jorgenson et al. 2001).
51 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 (bgs), with thicknesses varying from 10 to 118 feet, underlying sandy gravel in the alluvial plains. Permafrost controls groundwater movement in these areas.

4.8.7.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less Than Significant).

Cantonment Construction. Short-term and long-term effects would occur. Construction supporting the 1,000 Soldier stationing scenarios 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.

This project is greater than one acre and requires the submission of a Notice of Intent (NOI) to the U.S. Environmental Protection Agency (EPA) seven days prior to project initiation. The implementation of a Storm Water Pollution Prevention Plan (SWPPP) is also required. The facility design will be consistent with EPA and State of Alaska Construction General Permit Storm Water Pollution Prevention requirements and Fort Wainwright's Storm Water Pollution Prevention Plan to eliminate runoff contamination.

Construction activities accommodating growth of more than 1,000 Soldiers would occur to the north of the river and in the southeast portion of the installation. The use of construction equipment would remove vegetation and disturb soils. Disturbed soils could be transported away from the construction site through wind or water erosion. Soils could also be compacted during construction, making it difficult to support the growth of natural vegetation while increasing the potential for soil erosion. Direct and indirect short-term impacts could occur to nearby waterbodies from site runoff; however, due to the installation's existing monitoring and mitigation activities these effects are not expected to occur.

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).

Training Range Infrastructure Construction. Short-term and long-term effects are expected. 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. Long-term 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. Short-term effects would occur from soil transport and loading into nearby waterbodies. The installation would continue to use existing construction BMPs to mitigate any potential effects.

1 *Live-fire Training.* Weapons firing typically involve the disturbance of soils, denuding the soil
2 surface of vegetation and increasing the erodibility of soils. The implementation of any of these
3 stationing scenarios would increase the frequency of live-fire activities on ranges, potentially
4 causing a greater amount of soil disturbance. The installation's ITAM program monitors these
5 conditions and would continue to implement BMPs and mitigation measures that would
6 minimize the erosive effects from live-fire activities to soils (berm re-grading, re-vegetation, etc.).
7

8 For CS and field artillery units the use of ordnance items or explosives could cause wildfires
9 resulting in the removal of vegetation that normally protects soil from erosion. The presence of
10 vegetation slows surface water runoff by intercepting raindrops before they reach the soil
11 surface, and works to anchor the soil with roots. Without surface vegetation the top layer of
12 soils may be transported away due to natural processes, and the soil remaining may become
13 compacted leaving little opportunity for vegetation to re-establish itself. Vegetation removal
14 resulting from wildland fires could result in increased soil erosion by water and wind, indirectly
15 causing large-scale removal and redeposition of soils, gulying, or unstable slopes in areas of
16 steep slopes and rapid runoff. The impact would be directly proportional to the size of the fire.
17 Fuel maps were created indicating concentrations of fire-prone vegetation and areas
18 recommended for hazard fuel reduction projects; these may be found in the 2004 USAG Alaska
19 Transformation EIS.
20

21 *Maneuver Training.* There would be an expected increase in maneuver training at FWA. The
22 addition of 1,000 Soldiers may increase the frequency of maneuvers by 10 to 20 percent; 1,600
23 Soldiers would increase maneuver training by 20 to 40 percent; and 3,000 Soldiers by 30 to 60
24 percent. The increase in maneuver frequency is expected to correlate with resulting damage to
25 vegetation and disturb soils to an extent that would increase soil erosion rates and alter
26 drainage patterns in the training areas. This could lead to gulying, and indirectly to downstream
27 sedimentation, particularly when the vehicles travel off-road. CSS stationing scenarios, which
28 involve travel on existing roads and trails, are anticipated to lead to very limited new soil erosion
29 impacts.
30

31 During summer months, there is a great deal more open or standing water located on FWA.
32 During the warmer seasons the risk of sediment transport and loading to waterbodies on the
33 installation is much greater. In many areas, maneuver is reduced or restricted to minimize or
34 eliminate effects of training to water and to the soils underlain with permafrost. The amount of
35 land available on which to train is reduced, significantly in some areas during the summer
36 months.
37

38 Any permafrost in maneuver areas is particularly vulnerable if the vegetative layer is disrupted.
39 Removal of the vegetation layer may result in perched water tables or saturated conditions. The
40 vegetative layer and organic layer of the soils often insulate permafrost soils. When this is
41 removed the permafrost can melt creating saturated conditions or subsidence. The potential for
42 this occurs on most of our frozen soils particularly when the permafrost is shallow. The garrison
43 has BMPs in place to avoid impacts to permafrost, these include avoiding areas where
44 permafrost is known or thought to occur during warmer weather conditions, and the limitation of
45 maneuver over permafrost to wintertime when snow depth is sufficient enough to ensure an
46 insulating layer can support maneuver while maintaining the integrity of the permafrost below.
47

48 Training maneuvers in Alaska can and often are conducted more frequently in the winter
49 months when the ground is frozen to reduce impacts from soil erosion and to waterbodies. The
50 garrison is currently undertaking a project to improve roads and trails at DTA East, and is also
51 proposing to improve a portion of the Winter Trail on DTA West. 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 garrison also currently maintains a maneuver corridor that connects DTA West with TFTA, but generally it is used during the winter.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Training Range Infrastructure Construction. No construction would occur to accommodate CS or CSS units training at DTA. Therefore, no effects are anticipated.

Adding firing points to accommodate field artillery units would create localized construction site impacts due to the rather small area that may be affected. Similar to cantonment construction, temporary direct and indirect effects to soils would occur. The use of heavy equipment would remove vegetation and disturb and compact soil, making it difficult to support the growth of natural vegetation while increasing the potential for soil erosion. Direct and indirect short-term impacts to vegetation and nearby waterbodies from site runoff may occur. Fugitive dust may also occur, however impacts from dust would likely to 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.

Live-fire Training. Weapons firing can typically involve the disturbance of soils, denuding the soil surface of vegetation and increasing the erodibility of soils. While weapons firing would typically occur in existing training areas the frequency of the training events would increase and potentially cause a greater amount of soil disturbance; however, DTA's ranges are adequate to accommodate the increase in training, and there are sediment control measures already in place to mitigate sediment transport off-range.

Field artillery 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 expected because soil disturbance typically requires time and effort to amend.

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. Wildfire plays an important role in Alaskan ecosystems and is considered a beneficial impact on the natural environment. However, fire starts generated by military training activities often occur in elevated numbers and intervals, thereby causing unacceptable damage to critical vegetative cover that aids in stabilizing soils from wind and water erosion. 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 USAG Alaska Transformation EIS.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Maneuver Training. Long-term effects are anticipated. The increase in maneuver frequency is expected to damage or remove 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. During summer months, there is a great deal more open or standing water located throughout the training areas; and the risk of sediment disturbance and transport to waterbodies 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.

CSS stationing scenarios, which involve travel on existing roads and trails, are anticipated to lead to very limited new soil erosion impacts. However, activities associated with any Combat Engineers (CS 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. Any permafrost in maneuver areas is particularly vulnerable if the vegetative layer is disrupted. Removal of the vegetation layer may result in perched water tables or saturated conditions. The vegetative layer and organic layer of the soils often insulate permafrost soils. When this is removed the permafrost can melt creating saturated conditions or subsidence. The potential for this occurs on most of our frozen soils particularly when the permafrost is shallow. The garrison 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.

Between FWA's main post and its training areas (DTA, TFTA, and YTA) the installation has more than one million maneuver acres and capable of handling brigade-level training; and more than capable of handling maneuver associated with these stationing scenarios. Training maneuvers in Alaska can and often are conducted more frequently in the winter months when the ground is frozen to reduce impacts from soil erosion and to waterbodies.

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; however, 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.

Training required by these field artillery units include the maneuver of towed artillery (105mm and 155mm weapons) and other large weapons systems such as the HIMARS over unimproved and improved trail and road infrastructure. The heavy towed weapons may cause additional rutting and digging on unimproved surfaces. While impacts to maneuver areas may cause long-term direct effects, and may have impacts to soils underlain by permafrost, these units would typically travel on existing roads and trails in previously disturbed areas, reducing the potential for significant impacts to the environment.

4.8.8 Biological Resources

4.8.8.1 Affected Environment

Fish and Wildlife

Wildlife throughout FWA and its training areas include a variety of mammals and avian species including migratory birds. A greater discussion of the wildlife found on Army lands throughout USAG Alaska may be found in Appendix E of the U.S. Army Alaska Transformation Environmental Impact Statement (USAG Alaska, 2004); a brief summary of species found at interior Alaska sites is discussed below.

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 Alaska's cantonment and range areas are found in Section 4.10 of the Transformation of U.S. Army Alaska, Final Environmental Impact Statement (USAG Alaska 2004).

No federally threatened or endangered species are found on Fort Wainwright 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 U.S. Army Alaska Transformation Environmental Impact Statement (USAG Alaska, 2004). Table 4.8-5 below lists the species of concern found on USAG Alaska'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 (USAG Alaska 2008).

Table 4.8-5. Species of Concern found on USAG Alaska training lands (TFTA, YTA, DTA, GRTA)

Training Area	Group	Species	Scientific Name
TFTA	Bird	Alaska Sharp-tailed Grouse	<i>Tympanuchus phasianellus caurus</i>
	Bird	Great Gray Owl	<i>Strix nebulosa</i>
	Mammal	Wolverine	<i>Gulo gulo</i>
	Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>
	Bird	White-winged Scoter	<i>Melanitta fusca</i>
	Bird	Rusty Blackbird	<i>Euphagus carolinus</i>
	Bird	Western Wood-Pewee	<i>Contopus sordidulus</i>

Table 4.8-5. Species of Concern found on USAG Alaska training lands (TFTA, YTA, DTA, GRTA)

Training Area	Group	Species	Scientific Name
	Bird	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	Bird	Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
	Bird	Barrow's Goldeneye	<i>Bucephala islandica</i>
YTA	Bird	Great Gray Owl	<i>Strix nebulosa</i>
	Mammal	Wolverine	<i>Gulo gulo</i>
	Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>
	Bird	White-winged Scoter	<i>Melanitta fusca</i>
	Bird	Western Wood-Pewee	<i>Contopus sordidulus</i>
	Bird	Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
	Bird	Barrow's Goldeneye	<i>Bucephala islandica</i>
	Bird	Blackpoll Warbler	<i>Dendroica striata</i>
	Bird	Great Horned Owl	<i>Bubo virginianus</i>
	Bird	Black Scoter	<i>Melanitta nigra</i>
DTA - East	Mammal	Wolverine	<i>Gulo gulo</i>
	Bird	Boreal Owl	<i>Aegolius funereus</i>
	Bird	White-tailed Ptarmigan	<i>Lagopus leucura</i>
	Bird	Surfbird	<i>Aphriza virgata</i>
	Bird	Wilson's Snipe	<i>Gallinago delicata</i>
	Bird	Spruce Grouse	<i>Falcipennis canadensis</i>
	Bird	Sandhill Crane	<i>Grus canadensis</i>
	Bird	Upland Sandpiper	<i>Bartramia longicauda</i>
	Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>
	Mammal	Lynx	<i>Lynx canadensis</i>
DTA - West	Mammal	Wolverine	<i>Gulo gulo</i>
	Bird	Rusty Blackbird	<i>Euphagus carolinus</i>
	Bird	Boreal Owl	<i>Aegolius funereus</i>
	Bird	Great Gray Owl	<i>Strix nebulosa</i>
	Bird	Wilson's Snipe	<i>Gallinago delicata</i>
	Bird	Spruce Grouse	<i>Falcipennis canadensis</i>
	Bird	Sandhill Crane	<i>Grus canadensis</i>
	Bird	Upland Sandpiper	<i>Bartramia longicauda</i>
	Bird	Olive-sided Flycatcher	<i>Contopus cooperi</i>
	Mammal	Lynx	<i>Lynx canadensis</i>
GRTA	Bird	Trumpeter Swan	<i>Cygnus buccinator</i>
	Mammal	Wolverine	<i>Gulo gulo</i>
	Bird	Rusty Blackbird	<i>Euphagus carolinus</i>
	Bird	Boreal Owl	<i>Aegolius funereus</i>
	Bird	White-tailed Ptarmigan	<i>Lagopus leucura</i>
	Bird	Great Gray Owl	<i>Strix nebulosa</i>
	Bird	Surfbird	<i>Aphriza virgata</i>
	Bird	Wilson's Snipe	<i>Gallinago delicata</i>
	Bird	Spruce Grouse	<i>Falcipennis canadensis</i>
	Bird	Sandhill Crane	<i>Grus canadensis</i>
Species of Management Concern	Moose Caribou	These species are a separate list due to	

Table 4.8-5. Species of Concern found on USAG Alaska training lands (TFTA, YTA, DTA, GRTA)

Training Area	Group	Species	Scientific Name
	Bison	hunting interests by	
	Dall Sheep	outside groups.	
	Black Bear		
	Brown Bear		
	Wolf		
	Sharp-tailed Grouse		
	Ruffed		
	Grouse		
	Grayling		

Recreational Hunting and Fishing

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 & Game's 2007-2008 Alaska Hunting Regulations, No. 48 (Regulated by Title 5, Alaska Administrative Code and Title 16 of Alaska Statutes) (www.wildlife.alaska.gov, n.d.).

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 FWA main post, TFTA, and YTA do not support fish populations during winter. These lakes freeze completely, or, when iced over they lack sufficient dissolved oxygen for fish to survive through the winter. These lakes and ponds are stocked with Rainbow Trout, Arctic Char, Grayling, and Chinook salmon. Wild fisheries are supported at TFTA and YTA. DTA West is within the Fairbanks Management Area for fisheries, and DTA East is within the Delta Junction Management Area. Sixteen lakes on DTA, ranging in size from 3 to 320 acres, are stocked. Naturally occurring populations of lake chub (*Couesius plumbeus*), northern pike (*Esox lucius*), sculpin, and the northern longnose sucker (*Catostomus catostomus*) are found in lakes at DTA (BLM and U.S. Army 1994). Major streams on DTA are generally silt-laden and do not support fisheries. Jarvis Creek and the Delta River are glacially fed and flow from the north side of the Alaska Range to the Tanana River. Downstream of DTA, the Tanana River provides year-round habitat for some species, overwintering habitat for others, and supports migratory species. The mouth of the Delta River is important to chum salmon (*Oncorhynchus keta*). Grayling (*Thymallus arcticus* (*Pallus*)) migrate through these glacial streams to clear tributaries to spawn, and a few clear streams provide summer habitat for grayling (Parker 2004).

Anadromous fish stocks are not available on the training areas, but other freshwater fish can be harvested.

Subsistence Activities

FWA training areas fall in the traditional lands of Tanana and Tanacross Athabaskans. Traditional settlement patterns focused on a widely mobile and seasonal lifestyle. With the fall caribou and moose hunt playing a pivotal role in subsistence preparations for the winter; while summer activities were focused on fish camps, berry/root collecting, and sheep hunting (McKenna 1981). Fish and moose continue to play a primary role in interior Alaska communities near 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 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 & weasel, muskrat, otter, wolf, wolverine, grouse, and ptarmigan. Subsistence permits can be obtained for the take of these species (Transformation of U.S. Army Alaska FEIS (USAG Alaska 2004)).

Healy Lake 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 therefore 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/trappers.

The Native Village of Dot Lake 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 (Marcotte 1991). Some residents of Dot Lake, however, travel the extra distance to hunt on DTA.

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 Range and Training Land Assessment program. USAG Alaska conducts a baseline floristic survey at least once every ten years to identify all vegetative species that occur on all USAG Alaska 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 Fort Wainwright conducted in 1995 and released in 1996 indicated that there were no federally listed endangered or threatened plant species on 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 Alaska's 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 pulchellum pauciflorum*.

FWA has four vegetation types: moist tundra; treeless bogs/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 Alaska lands may be found in USAG Alaska's 2007 to 2011 INRMP.

Wildfire Management

Fire management on USAG Alaska installations is required by the Sikes Act and by Army Regulation. 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 (MOU) between the Bureau of Land Management (BLM) and USAG Alaska, as well as in the Army wildland fire policy guidance document (Department of the Army 2002).

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 Alaska; 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 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 Alaska 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 2002a).

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 2002a).

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 2002a). 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 2002a). 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.

4.8.8.2 Environmental Consequences

CSS (1,000): (Minor).

Cantonment Construction. Short-term minor effects are expected. 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) 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 (Bowles (1993), Holthuijzen et al. (1990), and Doresky et al. (2001)).

Impacts to vegetation from construction 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. Construction 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 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. 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. FWA has stormwater management plans in place to mitigate the effects of sediment and hazardous waste transport.

The land within the main cantonment area where construction would occur does not support any critical habitat, threatened or endangered species, or species of concern.

Construction would increase human presence and activity at construction sites. This increase is not expected to impact the risk of accidental wildfire ignition because fires at FWA are quickly identified and extinguished.

Training Range Infrastructure Construction. The stationing of 1,000 CSS Soldiers would drive the need to upgrade some ranges at FWA. Range expansion would occur over the footprint of previous ranges, or on highly disturbed soils. The impacts to vegetation would be both temporary from construction related traffic, and long term for vegetation that is removed and within a firing lane of upgraded ranges. 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 Alaska lands. The Range and Training Land Assessment program monitors vegetation and documents invasive plant species. These species are managed using integrated pest management techniques, whereby chemical control is minimized.

Construction noise in the FWA small arms complex 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.

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. 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. FWA has stormwater management plans in place to mitigate the effects of sediment and hazardous waste transport.

Live-fire Training. The frequency and intensity of live-fire training in the FWA small arms range complex would increase by approximately 10 to 15 percent. These units would use the same weapons systems that are currently being utilized at FWA and qualitatively noise generating events would be the same. Wildlife using these areas would adjust to any live-fire training modifications, 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.

USAG Alaska Range Regulation 350-2 discusses live-fire training on ranges and range how use is managed when wildlife are present on the range.

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 garrison on existing ranges and would be continued under all stationing scenarios.

Maneuver Training. The frequency of maneuver training could increase by approximately 10 percent. CSS 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 most of our frozen soils particularly when the permafrost is shallow. The garrison 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. However, these areas are avoided when possible and limited impacts would be anticipated as CSS units would mostly use existing roads and trails.

CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less Than Significant).

Cantonment Construction. Short and long-term minor effects are expected. New construction to the north and in the southeast corner of the installation cantonment area would be needed. Clearing of vegetation and soils may lead to the movement of animals away from the construction site.

Long-term impacts to vegetation from construction 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.

Several species of concern are found on USAG Alaska lands. Impacts to species of concern as part of these stationing scenarios would include increased habitat loss and disturbance. USAG Alaska's policies for management of these species are outlined in the Integrated Natural Resources Management Plan (USAG Alaska 2007).

Construction would disturb soils from excavation and digging. Soil could be transported to surface water, resulting in temporary increases in turbidity, and degrading the water quality for fish and invertebrate wildlife. Sediment impacts on aquatic wildlife could increase under scenarios to station either a Fires Brigade or 3,000 additional Soldiers at FWA as a result of cantonment construction on the northern side of the Chena River. FWA would continue to implement their BMPs to prevent increased turbidity and degradation to water quality.

Construction impacts could also make soils available for invasive plant species to become established. Equipment and vehicles could introduce these species in tire tread (as seeds) or

1 among construction materials. Management of invasive plant species is an issue of concern on
2 USAG Alaska lands. The Range and Training Land Assessment program monitors vegetation
3 and documents invasive plant species. These species are managed using integrated pest
4 management techniques, whereby chemical control is minimized.

5
6 Construction vehicles operating in the cantonment area could also spill hazardous materials
7 such as POLs onto the soil surface which could remain in the soils for an extended period of
8 time and may enter groundwater. POLs may also be transported to surface waters with runoff
9 from the construction site. Hazardous materials that enter the soil media and surface water may
10 have detrimental effects to the wildlife that inhabit and use these areas. FWA has stormwater
11 management plans in place to mitigate the effects of sediment and hazardous waste transport.

12
13 Construction would increase human presence and activity at construction sites. This increase is
14 not expected to impact the risk of accidental wildfire ignition because fires at FWA are quickly
15 identified and extinguished.

16
17 *Training Range Infrastructure Construction.* The stationing of these Soldier scenarios would
18 drive the need to upgrade some ranges at FWA, and for more than 1,000 Soldiers, would
19 require new range construction. Range expansion would occur over the footprint of previous
20 ranges on highly disturbed soils. The impacts to vegetation would be temporary as these
21 ranges are monitored and managed closely for impacts from other range activities (such as live-
22 fire). New construction that removes native vegetation could result in the introduction of
23 invasive weed or non-native plant species. Equipment and vehicles could introduce these
24 species in tire tread (as seeds) or among construction materials. Management of invasive plant
25 species is an issue of concern on USAG Alaska lands. The Range and Training Land
26 Assessment program monitors vegetation and documents invasive plant species. These
27 species are managed using integrated pest management techniques, whereby chemical control
28 is minimized.

29
30 Construction noise in the range areas could temporarily impact wildlife species that use these
31 areas for shelter and foraging. Construction activities (increase in vehicles and human
32 presence) create noise and disturbs habitat, however, these activities, as discussed above,
33 have not shown to have lasting effects.

34
35 Construction vehicles operating in the range area could also have direct, long-term effects to
36 vegetation (discussed above). Disturbance to vegetation and soils may make soils available for
37 transport to surface water. These effects would be temporary, lasting the duration of the
38 construction projects.

39
40 Construction vehicles may also cause spills of hazardous materials (POLs) onto the soil surface
41 and potentially directly effecting wildlife in these areas, or may be transported to waterbodies
42 that may be directly and indirectly affected through multiple exposure mechanisms. USAG
43 Alaska has strict policies for quick cleanup of these materials as soon as they are identified
44 (USAG Alaska PAM 200-1). FWA has stormwater management plans in place to mitigate these
45 effects.

46
47 *Live-fire Training.* The live-fire training associated with these stationing scenarios could
48 increase by 15 to 20 percent (for CS units), or 25 to 40 percent if a Fires Brigade is stationed at
49 FWA, 30 to 45 percent for 3,000 CSS Soldiers, and 45 to 60 percent for 3,000 CSS Soldiers.
50 Live-fire operations on ranges have the potential to displace various wildlife species. Individual
51 species mortality attributable to weapons qualification activity is highly unlikely. Firing lanes are

1 cleared of vegetation and Soldiers fire weapons from designated firing points to designated
2 targets.

3
4 Direct impacts to wildlife from noise associated with live-fire activities would be long-term.
5 Some firing points are established to fire into the Alpha Impact Area and Stuart Creek Impact
6 Area. Both of these sites have suitable moose habitat. The TFTA is one of the most dense
7 moose populations in the state. Many of the ungulate species found throughout Alaska training
8 lands do not avoid live-fire training areas due to the readily available vegetation providing
9 favorable foraging conditions. Direct impacts to moose and other species are avoided
10 whenever possible (USARAK 350-2).

11
12 Impacts from live-fire activities would include the disturbance of soils and vegetation on ranges.
13 CSS units, engineers and EOD units in particular, would use explosives which may create
14 craters and remove vegetation. These actions would also be anticipated to alter soil
15 permeability and future vegetative succession if new EOD or demolition qualification ranges
16 were established under scenarios to station 3,000 or more CS Soldiers. The explosives residue
17 associated with their use is not expected to migrate easily off-range due to low precipitation and
18 near year-round frozen conditions.

19
20 The increased frequency of live-fire training may also result in further restrictions to hunting and
21 fishing activities (recreational and subsistence). FWA's training lands are vast and provide
22 ample area for these activities. The garrison would continue to offer access to the public for
23 recreational and subsistence use.

24
25 Live-fire training could potentially increase the frequency of wildfires. Several fire mitigation
26 measures are being implemented throughout the garrison on existing ranges and would be in
27 place under all stationing scenarios. USAG Alaska is only subject to wildfire risk as certain
28 times of year and this risk is greatly reduced during the winter, spring melt, and fall thaw
29 seasons. In general, the wet conditions reduce the overall fire risk.

30
31 *Maneuver Training.* Additional Soldiers associated with these scenarios would increase the
32 frequency of maneuver training. For 1,000 Soldier stationing scenarios, FWA may experience
33 an increase by 10 to 20 percent; for the Fires Brigade the expected increase could be 20 to 40
34 percent; and for 3,000 Soldiers there would be an increase of maneuver training by 30 to 60
35 percent for different stationing scenarios.

36
37 CSS units would stay mostly on roads and hardened surfaces and there would be limited
38 impacts from maneuver training.

39
40 CS units would have a greater degree of impact on vegetation and wildlife communities due to
41 the increased frequency from off-road maneuver and ground clearance activities. The clearing
42 and some subsurface excavation activities of CS units would disturb soils (making them
43 available for transport to waterbodies) and remove vegetation (destroying vegetation and
44 potentially increasing the risk for invasive species). The Range and Training Land Assessment
45 program monitors vegetation and documents invasive plant species. These species are
46 managed using integrated pest management techniques, whereby chemical control is
47 minimized. CS units and a Fires Brigade (conducting higher percentages of off-road maneuver)
48 would be more likely to transport invasive seed propagates from location to location.

49
50 CS units that conduct off-road maneuvers may also have impacts to permafrost. Permafrost in
51 maneuver areas is particularly vulnerable if the vegetative layer is disrupted. Removal of the

1 vegetation layer may result in perched water tables or saturated conditions. When the
2 vegetative layer is removed the permafrost can melt creating saturated conditions or
3 subsidence. The potential for this occurs on most of our frozen soils particularly when the
4 permafrost is shallow. Any impacts to permafrost would be lasting and could alter the
5 landscape and habitat in range areas. Areas of known or suspected permafrost are usually
6 avoided.

7
8 The higher rate of maneuver may have short-term immediate impacts to wildlife from the
9 additional noise; however these impacts may be temporary as training with these scenarios
10 would not introduce new types of weapons to the range areas, and would not increase the level
11 of noise above what is heard currently on ranges. As cited above, wildlife would likely quickly
12 adjust to the new training schedules.

13
14 The risk of wildfire ignition is from vehicle use and human activity. Mitigation measures
15 currently utilized by the garrison are designed to prepare the landscape for impending wildfires.
16 Patches of thinned trees and controlled burns in high-risk areas may slow wildfire intensity and
17 speed.

18
19 The increased frequency of maneuver training may also result in restrictions to recreational and
20 subsistence uses of FWA lands. Overall impacts on subsistence may occur because of the
21 expected increase in access closures and the potential disruption or partial migration of wildlife.
22 The garrison would continue to identify areas available to the public and offer access for
23 recreational and subsistence use.

24
25 Local subsistence resources could be affected by increased frequency and intensity of training.
26 Increased training area access closures may affect subsistence users' taking of furbearers,
27 small game and upland birds. This impact is expected to be less than significant because
28 alternate areas would still be available for access to subsistence resources including wildlife,
29 fish, and plants.

30
31 Wildlife populations would be able to tolerate some disturbance from vehicular traffic; however,
32 information available currently is insufficient to determine the extent of population-wide effects.
33 Wildlife would be closely monitored by USAG Alaska's ecosystem management program to
34 understand better the impacts and the extent of disturbance resulting from increased road use.

35
36 Increases in maneuver training frequency could temporarily affect the distribution of moose.
37 Moose appear well adapted to multiple use management (forestry, hunting, and military
38 activities), and military training seems no more detrimental to moose populations than other land
39 uses (Andersen et al. 1996). Impacts to moose populations are potentially significant if winter
40 habitats were degraded. However, moose are readily adaptable to the creation of new early
41 succession habitat.

42
43 Maneuver training would also result in less than significant impacts to fisheries. Expected
44 increases in training levels could lead to higher rates of erosion and sedimentation, as well as
45 an increased potential for petroleum spills during refueling. However, such impacts would be
46 localized within waterways.

47
48 Additional personnel stationed at FWA might participate in recreational hunting and fishing
49 activities and could impact current availability of subsistence resources on interior Alaska lands.
50 An increase in hunting interest would compete with existing recreational hunters.

Donnelly Training Area

CSS (1,000), CS (1,000), CS (3,000), CSS (3,000): (Minor).

Training Range Infrastructure Construction. No additional construction would be required to accommodate Combat Support or Combat Service Support units.

Live-fire Training. The live-fire training associated with these stationing scenarios could increase by 15 to 60 percent (depending on the unit stationing scenario). Live-fire operations on ranges have the potential to displace various wildlife species. Individual species mortality attributable to weapons qualification activity is highly unlikely. Firing lanes are cleared of vegetation and Soldiers fire weapons from designated firing points to designated targets.

Direct impacts to wildlife from noise associated with live-fire activities would be long-term. 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 species are avoided whenever possible (USARAK 350-2).

Direct impacts to wildlife from noise associated with live-fire activities would be long-term but are not anticipated to be significant. If food is abundant on or near the ranges where Soldiers fire weapons and maneuver, wildlife species tend to adjust to training activities. Bowles (1990) found that predator species will often move toward the sound of gunfire because the disturbance of prey species (seeking shelter) may provide successful hunting opportunities. This was supported in a raptor study conducted by Andersen et al. (1986, 1990), and a study conducted by the Fish and Wildlife Service in 1988 regarding training noise impacts to Northern harriers. Bowles suggests that although other studies indicated large mammals may move away from military training sites, they will often return during times when the ranges are not in use.

There would be a corresponding increase in wildfire risk stemming from the increase in live-fire activities and wildfire risk associated with Soldier activities. Wildfire risk is increased by use of ordnance, vehicle maneuvers, and flammable materials and cigarettes. Reclassification of fire management options may occur to ensure fire management meets anticipated changes in wildfire risk. Prescribed burns of deadfall timber would continue to ensure reduced levels of fuel loading in range areas. In drought years fire management practices would be adjusted. The impacts of wildfire at DTA resulting from the training of additional units are anticipated to be mitigable to less than significant.

The increased frequency of live-fire training may also result in further restrictions to public hunting and fishing activities (recreational and subsistence). FWA's training lands are vast and provide ample area for these activities. USAG Alaska would continue to offer access to the public for recreational and subsistence use when training is not occurring.

CS units would support CALFEX training events at the DTA BAX CACTF and other collective training sites. This training would increase the potential for wildfire at these sites under CS stationing scenarios and increase the risk of invasive species establishment and changes attributable to unnatural vegetative succession at DTA. As discussed previously, these risks are reduced by existing wildland fire mitigation measures and restrictions on particular munitions use when fire danger ratings are elevated (FEIS for the Construction and Operation of a Battle

1 Area Complex and Combined Arms Collective Training Facility within U.S. Army Training Lands
2 in Alaska (USAG Alaska June 2006)).
3
4

5 **Fires Brigade (1,600): (Less than Significant).**
6

7 *Training Range Infrastructure Construction.* Construction of new firing points would have short-
8 term impacts from vehicle and equipment noise; however, these activities have not been shown
9 to have significant long-term impacts to wildlife behaviors or reproductive success. Movement
10 of equipment into areas that do not currently support military activities could increase the
11 establishment of nonnative plants. Construction equipment and materials also introduce
12 invasive species and other weeds to the area which may affect (in extreme cases) the long-term
13 habitat of some wildlife.
14

15 Construction impacts to surface waters and wetlands would continue to be mitigated through the
16 installations institutional programs (ITAM, stormwater management, etc.).
17

18 *Live-fire Training.* The increased artillery fire from a Fires Brigade may have a cratering effect in
19 the impact area, greatly disturbing soils and removing vegetation. These impacts would be
20 long-term and significant to the vegetation within the impact area.
21

22 Direct effects to wildlife include disturbance from artillery, rocket, or mortar fire that may result in
23 an increase in animal mortality, or noise disruption. Some animals may be disturbed by noise
24 and many other may adjust. USAG Alaska Range Regulation 350-2 discusses live-fire training
25 on ranges and how use is managed when wildlife are present on the range.
26

27 Wildlife species that remain within the impact area and associated surface danger zones could
28 be directly affected by munitions. Higher training levels at existing ranges would increase
29 incidental mortality to wildlife, especially for areas that may support moose habitat. Live fire
30 training into the impact area may also cause some issues with migratory birds. This area is a
31 major migration flyway for migratory birds. While DoD does have an exemption from the MBTA
32 for military training, USAG Alaska identifies these conflicts and avoids impacts to migratory birds
33 to the extent possible. USAG Alaska Range Regulation 350-2 discusses live-fire training on
34 ranges and how use is managed when wildlife are present on the range.
35

36 Many wildlife species could be impacted by the additional ordnance and artillery training, and
37 conversely training may be impacted by the presence of wildlife. For example, Bison tend to
38 congregate in the training areas at DTA. During heavy artillery fire a greater amount of
39 disturbance is anticipated which could influence foraging and calving. Further, herds of Caribou
40 and Moose often travel through DTA lands during migration seasons which inhibit training and
41 require the garrison to monitor and avoid these species, often resulting in modifications to the
42 training schedule.
43

44 There would be a corresponding increase in wildfire risk stemming from the increase in live-fire
45 activities and wildfire risk associated with training activities. Wildfire risk is increased by use of
46 ordnance, vehicle maneuvers, and flammable materials and cigarettes. Reclassification of fire
47 management options may occur to ensure fire management meets anticipated changes in
48 wildfire risk. Prescribed burns of deadfall timber would continue to ensure reduced levels of fuel
49 loading in range areas. In drought years fire management practices would be adjusted. The
50 impacts of wildfire at DTA resulting from the training of additional units are anticipated to be
51 mitigable to less than significant.

The increased frequency of live-fire training may also result in further restrictions to public hunting and fishing activities (recreational and subsistence). FWA's training lands are vast and provide ample area for these activities. USAG Alaska would continue to offer access to the public for recreational and subsistence use when training is not occurring.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Maneuver Training. Additional Soldiers associated with these scenarios would increase the amount of maneuver on training lands under various stationing scenarios between 10 to 60 percent. Although these units would stay mostly on roads and hardened surfaces, possible disturbances to soils in off-road training areas may erode away vegetation and further compact soils making it more difficult for vegetation to re-establish itself. Removal of the vegetation layer may result in disturbance to frozen soils and create saturated conditions. The vegetative layer and organic layer of the soils often insulate permafrost soils. When this is removed the permafrost can melt creating saturated conditions or subsidence. The potential for this occurrence is high when the permafrost is shallow. USAG Alaska 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.

Military activities can lead to alteration of habitats or disruption to animal behavior. For example, erosion from maneuver activities may occur at stream crossings. Stream bank erosion can cause sedimentation to waterways, directly affecting their water quality and inhabitants, and indirectly affecting the wildlife that use those waterbodies for foraging.

CS units would have a greater degree of impact on vegetation and wildlife communities due to the increased frequency from off-road maneuver and ground clearance activities. Any effects to permafrost (as discussed above) would be significant and irreversible.

The maneuver of field artillery would generally occur on existing roads and trails; however these vehicles and their towed artillery may be slightly heavier and have a slightly larger footprint than typical traffic in range areas (with the exception of Stryker units training there). Possible effects could include rutting and digging which may have additional impacts to permafrost, and vegetation. Any effects to permafrost would be significant and irreversible.

The increased frequency of maneuver training may also result in restrictions to recreational and subsistence uses of FWA lands. USAG Alaska would continue to identify areas available to the public and offer access for recreational and subsistence use when training is not occurring.

4.8.9 Wetlands

4.8.9.1 Affected Environment

From the years 2000 to 2005 USAG Alaska obtained a permit to conduct training in wetlands at FWA including its training areas: Tanana Flats Training Area, Yukon Training Area, and Donnelly Training Area. 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 Alaska is currently working towards a renewal. In the interim, USAG Alaska remains diligent in protecting and preserving these resources.

Fort Wainwright Main Post has approximately 6,500 acres of palustrine, riverine, and lacustrine-type wetlands. Wetlands comprise approximately 483,500 acres (74%) of the Tanana Flats Training Area, and Yukon Training Area has 42,600 acres (17%) classified as wetland. DTA has an estimated 431,940 acres of wetlands with palustrine, riverine, and lacustrine types identified. The 431,940 acres equates to about 68% 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 4.8-6 demonstrates the wetland types found at FWA and interior Alaska training areas. More discussion of wetlands on USAG Alaska lands may be found in the USAG Alaska INRMP 2007-2011, the FEIS for the Permanent Stationing of the 2/25th SBCT (USAEC 2008), and the Transformation of U.S. Army Alaska FEIS (USAG Alaska 2004).

Table 4.8-6. Wetland types found at FWA and Interior Alaska training areas

Wetland Type	% of total Wetlands	Wetland Characterization and/or Location	Vegetation
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 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;	Alder and willow

Table 4.8-6. Wetland types found at FWA and Interior Alaska training areas

Wetland Type	% of total Wetlands	Wetland Characterization and/or Location	Vegetation
Lowland Wet Needleleaf Forest	11	generally found along South Fork Chena River lowlands, the Stuart Creek Impact Area, and the French Moose Creek area 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	Sedges, Dwarf birch, Willow, Ericaceous shrubs, and Sphagnum moss
Lowland Wet Low Scrub and Lowland Tussock Scrub Bog	35	Found above the treeline, primarily in the southern portion of DTA west along the foothills of the Alaska Range Poorly drained due to permafrost.	Willows, Dwarf birches, Ericaceous shrubs, Black spruce, and Sphagnum moss
Lowland Wet Needleleaf Forests	12	Found above the treeline, primarily in the southern portion of DTA west along the foothills of the Alaska Range Poorly drained due to permafrost; moderately acidic.	Ericaceous shrubs, Black spruce, and Sphagnum moss
Riverine and Lacustrine Wetland Complexes	7	Common along the northern portion of the Lakes Impact Area and the Little Delta Training Area. Common along the Delta and Little Delta rivers and Jarvis Creek, ponds, lakes, and their margins	Forest broadleaf, needleleaf, or mixed shrubs, Willows and Alders, grasses, and sedges

4.8.9.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. No impacts are anticipated under scenarios which solely involve construction in-filling (demolition of existing facilities and subsequent construction) which would take place as part of the 1,000 Soldier stationing scenarios.

1 Long-term significant impacts are possible from each of the other stationing scenarios. As
2 indicated above, the main post of FWA is made up of approximately 42 percent wetlands.
3 Impacts to these areas would depend on siting of new facilities to accommodate growth.
4 Impacts are most likely under 3,000 Soldier stationing scenarios as more land (up to 150 acres)
5 is required to accommodate the cantonment facilities north of the Chena river or southeast of
6 the installation.

7
8 Heavy equipment and vehicles in the range area could remove vegetation and disturb soils,
9 making them prone to erosion and creating runoff to nearby surface water and wetlands.
10 Disturbed and compacted soils may also affect seedling establishment and near surface
11 hydrology which may inhibit the reestablishment of plant communities. During springtime, it
12 may be more difficult to differentiate between wetlands and temporary standing water from
13 snowmelt; both can appear hydrologically similar without further investigation.

14
15 Direct and indirect effects could also include decreased volume of water flowing to wetlands
16 during low flow seasons; loss of streambank stability, loss of organic matter and habitat that
17 would result in lower productivity; and loss of permafrost that would create thermokarst
18 conditions. USAG Alaska has best management practices in place to avoid impacts to
19 permafrost to the extent possible.

20
21 Construction that occurs north of the river could directly impact wetland areas or surface waters
22 as a result of required fill activities to support facility construction. Also, the removal of upland
23 vegetation as a result of clearing activities could result in adjacent wetland degradation due to
24 increased sediment loading during rain events while construction is taking place. The effects
25 from construction would be less harmful in winter due to the frozen nature of the wetlands, and
26 the snowpack that protects vegetation.

27
28 *Training Range Infrastructure Construction.* Impacts may be temporary or long-term. Heavy
29 equipment and vehicles in the range area could remove vegetation and disturb soils, making
30 them prone to erosion and creating runoff to nearby surface water and wetlands. Disturbed and
31 compacted soils may also affect seedling establishment and near surface hydrology which may
32 inhibit the reestablishment of plant communities. During springtime, it may be more difficult to
33 differentiate between wetlands and temporary standing water from snowmelt; both can appear
34 hydrologically similar without further investigation. The installation takes precaution if siting a
35 range to avoid impacts to wetlands where possible. However, to support operational range
36 concepts, some wetlands would need to be impacted in upgrading qualification ranges and
37 siting a new rifle range. These wetlands would likely be filled, or the vegetative cover would be
38 altered, changing the function of the wetland, in order to allow for live-fire activities.

39
40 *Live-fire Training.* The installation would try to site ranges and their firing points away from
41 documented wetland areas to avoid potential impacts where possible. Impacts could occur to
42 wetlands on the range area in the form of munitions constituent loading and sedimentation in
43 wetlands located on Army firing ranges.

44
45 *Maneuver Training.* CSS maneuver scenarios would lead to minimal additional impacts to
46 wetlands at FWA. Increased use of un-improved trails would result in more sediment loading
47 into adjacent wetlands and surface waters, though the overall increase in use would be
48 expected to be minimal. No additional roads or trails would be constructed, therefore only minor
49 impacts to nearby wetlands from runoff are anticipated.

CS units, particularly engineers, and the Fires Brigade could adversely affect wetlands through off-road maneuver of armored or tracked vehicles, or increase sediment loading through surface excavation in the case of engineer units. If, during the course of training, permafrost is disrupted, the possibility exists that land subsidence may occur and water may pool in those areas with steeper slopes. Any permafrost in maneuver areas is particularly vulnerable. The vegetative and organic layer of the soils often insulates permafrost soils. When this is removed or severely disrupted the permafrost can melt creating saturated conditions or subsidence. The potential for this occurs on frozen soils particularly when the permafrost is shallow. Areas known or thought to contain permafrost are avoided to the extent possible. The availability of training land increases during the wintertime. In addition, under CS and Fires Brigade stationing scenarios, DTA wetlands could experience increased sediment loading of surface waters around the BAX training site when wet conditions and off-road maneuver occur.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Training Range Infrastructure Construction. No additional construction would be required to accommodate CS or CSS units therefore no impacts are anticipated.

Construction of new firing points to accommodate a Fires Brigade may cause only short-term impacts to surface water and wetlands from runoff. USAG Alaska has BMPs in place to minimize any potential impacts. Wetland areas would be avoided to the extent possible.

Live-fire Training. Long-term effects to wetlands in the impact area could occur. Any increases in damage to wetlands from high explosive munitions would be restricted to impact areas.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Maneuver Training. Long-term effects are anticipated. Currently the garrison has an adequate road and trail network to accommodate any of these stationing scenarios. Much of these areas have limited access during summer months. Spring and summertime access pose significant issues due to presence of standing (unfrozen) water, wetlands, and lack of access across large rivers. For the most part, DTA West and TFTA are inaccessible to mounted maneuver during summer, except for airlifts of vehicles. The amount of maneuverable area substantially increases during the winter months when the ground is frozen. Winter damage would be minimized by the presence of a minimum of six inches of snow pack, which acts as an insulating layer against significant damage to the frozen soil below. Overall, FWA has an adequate amount of training area to select from and will continue to avoid impacts to wetlands to the extent possible as the garrison would continue to utilize mitigations and BMPs. The effect from increased training exercises is anticipated to be less than significant.

Maneuvers can directly or indirectly alter the composition of plant communities and vegetative structure. If wetlands are disturbed, small annual plants or invasive species often replace large perennial plants. Maneuver impacts could decrease plant cover and densities of woody

1 vegetation, resulting in reduced wetland function and habitat quality. In severe cases, damaged
2 plant communities could be replaced by lower quality plant communities.

3
4 Soils at disturbed sites also tend to become more compacted, which can affect seedling
5 establishment, water and nutrient uptake, and root penetration. Reestablishment of plant
6 communities may be impeded by changes in soil properties. Soil erosion and transport may
7 increase due to a loss in stability from the removal of vegetative cover and the underlying
8 supportive root system. Damage to wetlands in northern climates, such as Alaska, can affect
9 the insulating layer that protects permafrost. This could create thermokarst conditions, possibly
10 leading to subsidence, and could increase sediment delivery to nearby waterways. As a result,
11 the water quality and aquatic habitats could be degraded.

15 4.8.10 Water Resources

16 4.8.10.1 Affected Environment

18 Watershed

19
20 The Chena River originates in the non-glaciated Yukon-Tanana Uplands and passes through
21 FWA Main Post. The U.S. Geological Survey maintains a gauging station on the Chena River.
22 Surface water quality on FWA is good. The Chena River has been classified as Class A, Class
23 B, and Class C. The pH varies seasonally from neutral to slightly below neutral. Groundwater
24 flow varies greatly based on location. Groundwater quality is predominantly good on FWA,
25 although past military activities have degraded groundwater in some locations which are
26 currently undergoing remediation (these areas have contributed to FWA main post having been
27 classified as Comprehensive Environmental Response, Compensation, and Liability (CERCLA)
28 site). Groundwater on FWA Main Post is classified as an alluvial aquifer, fed primarily from the
29 Tanana River. Groundwater there does contain high levels of metals, especially iron and
30 arsenic. Elevated arsenic levels are prevalent in upland areas. These metals are naturally
31 occurring and are not related to human-caused pollution.

32
33 TFTA is within the Tanana River watershed, and the river comprises the eastern and northern
34 boundary of the training area; and the Wood River forms the training area's western boundary.
35 TFTA contains a number of small lakes and ponds including the Blair Lakes covering
36 approximately 2,718 acres. Much of this is considered wetlands. USAG Alaska also employs
37 the use of ice bridges over the Tanana River to provide access to TFTA from FWA Main Post
38 during the winter months.

39
40 The Little Chena River flows northwest of YTA. All streams at the training area originate in the
41 Yukon-Tanana Uplands which are non-glaciated. Streams located in the northern portion of
42 YTA drain into the Chena River; whereas streams originating in the southeastern portions of
43 YTA drain into the Salcha River, a tributary of the Tanana River. YTA has many small lakes
44 and wetlands that cover about 498 acres.

45
46 DTA is located within the Tanana Basin watershed, an interior glacial waterway. There are four
47 main rivers crossing DTA: from east to west they are: Jarvis Creek, Delta River, Delta Creek,
48 and Little Delta River. The Delta River flows northward 80 miles from its headwaters to its
49 confluence with the Tanana River and runs through the DTA for an estimated 30 miles. It drains
50 an area approximately 1,650 square miles. Due to the combination of glacial and non-glacial
51 inputs the Delta River is difficult to classify as specifically glacial or non-glacial in nature. Jarvis

Creek originates at the terminus of Jarvis Creek 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 estimates an 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 Granite Mountain 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 states 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 S.U. which are within the states established limits of 6.5 to 8.5 S.U.

Water Supply

Water for FWA is supplied to the installation through a series of subsurface wells and passed through the on-site water treatment plant (WTP). The WTP 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. Currently, utilities throughout USAG Alaska are undergoing privatization. Doyon Utilities will be the owner and operator of the utility system at FWA.

Water for DTA is provided by wells that yield as much as 1,500 gallons per minute (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

FWA has an on-site wastewater collection system that is discharged into the Golden Heart Utilities wastewater system through a central lift station (Doyon Utilities Web Site, n.d.). Fairbanks Sewer & Water is the parent company for Golden Heart Utilities Wastewater Treatment Plant, which provides service to more than 55,000 people and operates at a capacity of approximately 8.0 MGD (Fairbanks Sewer & Water Web Site, n.d.). The wastewater collection system at DTA is connected to a small lagoon treatment facility.

Stormwater

FWA's (and interior Alaska training sites) stormwater program is comparable to that of Fort Richardson. There is a strict enforcement of BMPs to ensure against stormwater runoff from the installation. There have been no NOV's issued to the installation for stormwater compliance violations in the last five years.

4.8.10.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

1
2 *Cantonment Construction.* Construction supporting the 1,000 Soldier stationing scenarios within
3 the main cantonment area would require the tie-in of utilities to the existing infrastructure. There
4 is more than adequate water supply and infrastructure to accommodate each of these stationing
5 scenarios. There is sufficient capacity at the installation's central lift station to accommodate the
6 additional wastewater flow. Any upgrades to the collection facilities or distribution to Golden
7 Heart Utilities may be assumed by Doyon Utilities.

8
9 Stationing more than 1,000 Soldiers at FWA would require the installation to construct new
10 facilities in new areas of FWA (north of the river and to the southeast of the cantonment area).
11 The action would require the installment of new power lines and potentially a new substation to
12 handle the additional capacity; water distribution and wastewater collection systems; and
13 telecommunication capability. Due to the increased demand much of the wastewater collection
14 and water distribution system would need to be upgraded.

15
16 Construction activities could affect surface water by localized increases in erosion and runoff.
17 Potential impacts would include increased overland flow and runoff and decreased percolation
18 to groundwater due to surface compaction. Impacts from construction runoff are expected to be
19 temporary. FWA has a robust stormwater monitoring and compliance program, and is prepared
20 to handle additional capacity. Any construction that disturbs more than one acre of land would
21 require a stormwater pollution prevention plan including use of BMPs to minimize pollution.

22
23 Operation of construction vehicles could cause spills of POLs and other hazardous and toxic
24 substances, which could result in indirect impacts to surface and/or groundwater if accidentally
25 released into the environment. The Army has implemented BMPs, an SPCC, and an SWPPP to
26 address leaks or spills of hazardous materials. With these established measures, impacts are
27 expected to be less than significant.

28
29 *Training Range Infrastructure Construction.* Short-term effects to water quality would occur.
30 During ground preparation for range expansion or new construction, grading, excavating, and
31 trenching may expose erodible soils to stormwater runoff and increase the potential for
32 sediments to migrate to surface waters. These potential impacts would be reduced to
33 acceptable levels by implementing standard construction BMPs. Impacts from construction
34 runoff are expected to be temporary. The installation's stormwater monitoring and compliance
35 program is prepared to handle additional capacity.

36
37 Operation of construction vehicles could cause spills of POLs and other hazardous and toxic
38 substances, which could result in indirect impacts to surface and/or groundwater if accidentally
39 released into the environment. The Army has implemented BMPs, an SPCC, and an SWPPP to
40 address leaks or spills of hazardous materials. With these established measures, impacts are
41 expected to be less than significant.

42
43 *Live-fire Training.* The increase in weapons qualification training would increase lead and other
44 materials on ranges. Runoff from impacted berms and disrupted soils is possible as the added
45 live-fire activity may increase sediment transported to waterways draining the ranges, and
46 ultimately to surface waters beyond the installation boundary. In the absence of mitigation, an
47 increase in sediment erosion could result in greater impacts, possibly in exceedances of health-
48 based standards or antidegradation policy goals. The installation's ITAM program monitors
49 impacts from live-fire activities and would continue to institute the required mitigations and
50 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 be indirect effects resulting from vehicles parked at the training sites.

The risk of wildland fires is expected to remain at about the same level as under existing conditions or slightly higher due to the increase in Soldiers using these ranges. Wildland fires 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.

Maneuver Training. Additional traffic on the range road network and stream crossings during maneuver 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 throughput in those areas.

Increased maneuver training 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 SPCC would minimize potential impacts resulting from leaks or spills of hazardous materials. Impacts are expected to be less than significant.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Training Range Infrastructure Construction. No additional range construction would be required for CS or CSS units.

Direct effects to the environment may include disturbance of soil and vegetation. Stormwater runoff may transport loose sediment to surface waters increasing turbidity and degrading water quality. Indirect effects could occur as impacts to surface soils could result in damage to permafrost below.

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, and an SWPPP to address leaks or spills of hazardous materials. With these established measures, impacts are expected to be less than significant.

Live-fire Training. The increase in weapons qualification training for all of these Soldier stationing scenarios 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. The installation's ITAM program 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 be indirect effects resulting from vehicles parked at the training sites.

Artillery and rockets (associated with the HIMARS) use may have long-term effects to the impact areas. The explosive residue contained in munitions items may be dispersed around the impact area if the munition item fails to properly function (low-order detonation).

The risk of wildfires is expected 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.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Less than Significant).

Maneuver Training. Additional traffic on the range road network and stream crossings during maneuver 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. The added vehicles could further compact or damage soils making it difficult for vegetation to reestablish itself. These areas could be more prone to runoff and sedimentation.

The availability of maneuver lands at these training areas increases during winter months. Due to the presence of surface water and wetlands in FWA's training areas during spring and summertime, access to maneuver land is limited (to avoid adverse impacts to the environment while ensuring the sustainability of training lands), which directly impacts unit readiness.

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 SPCC would minimize potential impacts resulting from leaks or spills of hazardous materials. Impacts are expected to be less than significant.

4.8.11 Facilities

4.8.11.1 Affected Environment

Facilities and infrastructure at 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 eleven supply/storage locations found throughout the cantonment area including two ammunition storage facilities. The additional areas are used to store inert supplies, equipment and/or material.

As part of its facilities and infrastructure, FWA has its own airfield (Wainwright Army Airfield) and also uses nearby Eielson Air Force Base for large-scale deployments. Both military airfields can support any type of military aircraft. Wainwright Army Airfield has one active runway; several ancillary taxiways, and hangars. Only one range maintenance building is located at Donnelly.

The Trans-Alaska Pipeline passes from Prudhoe Bay, through DTA West, where it ends in Valdez, AK. The pipeline carries crude oil and has a 50 feet wide right-of-way.

There are over 1,500 housing units on more than 400 acres of land and spread throughout six neighborhoods on the cantonment area. These housing units are isolated from noise and pollution generating activities such as vehicle maintenance. Due to age of housing the installation has begun to revitalize Family housing through new construction to upgrade and/or replace substandard facilities.

In 2005, the Army commissioned a Housing Market Analysis of assets on Fort Wainwright 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. The growth covered by this market analysis does not include potential growth associated with the proposed action.

The quality and condition of Army ranges and training lands are managed and monitored as a part of the Army's Sustainable Range Program (SRP) and Ranges and Training Land Program (RTLTP). Table 4.8-7 below categorizes the types of training range infrastructure provided by Fort Wainwright and Donnelly Training Area. DTA has no family housing facilities or community support or recreation facilities.

Table 4.8-7. Acres of USAG Alaska Range And Training Land Facilities

Installation	Small Arms Ranges	Major Weapons Systems Ranges	Non Live-fire Ranges	Maneuver Training Areas	Total
Fort Wainwright					
Main Post	143	5,793	22	5,151	11,109
Tanana Flats Training Area	0	58,828	0	595,370	654,198
Yukon Training Area	2,386	25,854	5	229,035	257,280
Donnelly Training Area					
Donnelly Training Area	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

4.8.11.2 Environmental Consequences

CSS (1,000), CS (1,000): (Significant but Mitigable).

Cantonment Construction. Long-term effects are anticipated as a result of required construction to support Army growth. Construction at the main cantonment area would occur as infill to accommodate these Soldier stationing scenarios; and would include COFs, Motor Pools, Brigade and Battalion Headquarters buildings, additional storage, military and vehicle parking, among other facilities. These facilities would be tied in to existing utilities and infrastructure, but some upgrades to the water distribution and wastewater collection system may be required. The entire heat and power distribution system may need to be expanded and new substations would need to be installed. The following facilities may require improvements to support additional troops and their dependents: Bassett Army Community Hospital, the commissary, Post Exchange, gymnasiums and fitness centers, and increased staff space for the Garrison Commander's staff.

Family housing is currently being privatized. There may be a shortfall in housing units available to accommodate unaccompanied Soldiers and Soldiers with Families. Additional Soldiers and Families may be absorbed by both the City of Fairbanks and the Army. New housing units may be constructed at the southeast or northern portion of the installation.

Currently, parcels of land on the installation are dedicated to large scale environmental remediation projects. While it is not likely that infill construction would conflict with these areas, coordination with the EPA and state of Alaska may still be necessary.

Training Range Infrastructure Construction. Range expansion would occur at several ranges in order to meet the increase in training needs. Under current conditions, the ranges do not meet Standards in Training Commission (STRAC) requirements or range requirements sited in Training Circular 25-8 (US Army 2006).

Any ranges constructed would provide limited sanitation in the form of self-contained waste collection points that would be emptied on a regular basis.

Live-fire Training. Long-term impacts would include the increase in range use, resulting in the increase of ammunition and the generation of lead and other materials on ranges and within impact areas.

Maneuver Training. There is adequate maneuver area to train combat support or combat service support units. Training at FWA is likely to occur at the squad or platoon level of training, where company and above level training may occur at one of the other designated training areas (YTA, TFTA, DTA).

Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. Implementation of any of these stationing scenarios would require construction of new facilities. Approximately 75 to 150 acres of land would be needed north of the river to accommodate scenarios involving more than 1,000 Soldiers. There are currently no facilities in this area. Construction would involve all new facilities including headquarters buildings, motorpools and maintenance, new utility water and wastewater distribution and collection lines, and new power and telecommunication utilities. The entire heat and power distribution system may need to be expanded and new substations would need to be installed. Due to the scale and complexity of required construction additional coordination with commercial contractors, planners, and state and federal agencies may also be needed for

1 permitting and consultation. Additional Family housing may be constructed in other portions of
2 the installation.

3
4 *Training Range Infrastructure Construction.* Range construction and expansion activities would
5 occur in order to meet the increase in training needs. Under current conditions, the ranges
6 would not meet range requirements sited in Training Circular 25-8 (US Army 2006). New SDZs
7 would be required for new ranges.

8
9 *Live-fire Training.* Long-term impacts would include the increase in range use, resulting in the
10 increase of ammunition and the generation of lead and other materials on ranges and within
11 impact areas.

12
13 *Maneuver Training.* There is adequate maneuver area to train combat support or combat
14 service support units. Training at FWA is likely to occur at the squad or platoon level of training,
15 where company and above level training may occur at one of the other designated training
16 areas (YTA, TFTA, DTA).

17 18 19 **Donnelly Training Area**

20
21 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).**

22
23 *Training Range Infrastructure Construction.* No new range construction would be required to
24 support CS or CSS units. Any construction to support new firing points for the Fires Brigade
25 would also need to provide limited sanitation in the form of self-contained waste collection points
26 that would be emptied on a regular basis. There may be an expected increase in demand for
27 utilities at new firing points.

28
29 *Live-fire Training.* Long-term impacts would be the increase in range use, resulting in the
30 increase of ammunition and the generation of lead, explosive materials, or UXO and other
31 materials on DTA ranges.

32 33 34 **Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area**

35
36 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).**

37
38 *Maneuver Training.* There are no plans to extend utilities to these areas therefore the impact
39 would continue to be minimal. Other support infrastructure at training sites is adequate to
40 accommodate these stationing scenarios.

41 42 43 44 **4.8.12 Energy Demand/Generation**

45 **4.8.12.1 Affected Environment**

46
47 FWA has a central coal-fired power plant that produces electricity and steam heat for the
48 installation and is responsible for approximately 80 percent of the energy capability throughout
49 FWA (Doyon Utilities Web Site, n.d.). Power is supplemented by the Golden Valley Electric
50 Association (GVEA). Seasonal maintenance of the power generation facility creates a 5 MW
51 shortage, so the installation relies on GVEA to augment the power supply as needed. 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 boilers.

Power needs at DTA are supplied via a combination of the GVEA, the power plant at Fort Greely, and on-post generators that are managed by National Missile Defense personnel (Transformation of U.S. Army Alaska FEIS (USAG Alaska 2004)).

4.8.12.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. For any level of growth significant long-term impacts to the power generation system would be expected. The installation's current energy infrastructure may not be able to accommodate the addition of 1,000 to 3,000 Soldiers. An increase in population associated with any of these stationing scenarios would increase demand on the power plant, energy distribution lines, and infrastructure. The entire heat and power distribution system may need to be expanded and new substations would need to be installed.

The 3,000 Soldier scenarios would exceed the energy capacity of the installation and additional power may need to be purchased from GVEA, potentially creating regional power shortfalls.

Training Range Infrastructure Construction. There may be additional long-term demand in training areas; however demand is anticipated to be slight and inconsequential compared to system capacity. Any identified construction of new ranges would also need to account for energy distribution capacity.

Live-fire Training. Live-fire training would increase under these stationing actions; and the addition of a firing range would add demand to the power supply; however, impacts from energy use are expected to be less than significant as the power required by live-fire facilities is minimal compared to other facility types (such as housing or headquarters buildings). Range facilities at FWA are not connected to the central coal-fired power plant and have individual furnaces or boilers.

Maneuver Training. Maneuver training would increase under this alternative; however, impacts to energy use and costs are expected to be less than significant. During maneuver training, units' power generation is typically self-contained (generators) and does not tap into existing power infrastructure.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Training Range Infrastructure Construction. The construction or upgrade of new firing points for the Fires Brigade (field artillery) is not anticipated to have impacts to the electrical distribution system to DTA as there is no power requirements associated with these live-fire areas.

Live-fire Training. Live-fire training would increase under these stationing actions; and the addition of a firing range would add demand to the power supply; however, impacts from energy

use are expected to be less than significant as the power required by live-fire facilities is minimal compared to other facility types (such as housing or headquarters buildings).

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Maneuver Training. Maneuver training would increase under these stationing scenarios; however, impacts to energy use would be considered minor. During maneuver training units power generation is typically self-contained (generators) and does not tap into existing power infrastructure.

4.8.13 Land Use Conflict/Compatibility

4.8.13.1 Affected Environment

Existing land use boundaries are defined for major land use categories identified in the U.S. Army Corps of Engineers 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.

FWA and Interior Alaska training sites consist 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. The specific acreages associated with these land use categories are listed in Table 4.8-8 below.

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 small arms complex. 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 BAX and CACTF construction. This is as required by the Sikes Act.

Table 4.8-8. Acres of USAG Alaska Land Use Planning Categories

Location	Facilities								Total
	Transportation	Housing	Community	Installation Support	Range & Training Land	Maintenance	Outdoor Recreation	Miscellaneous	
FWA	883	538	288	40	922,587	1,652	1,428	465	927,881
DTA	0	0	0	0	661,944	0	0	0	661,944
Total	883	538	288	40	1,584,531	1,652	1,428	465	1,589,825

Transformation Environmental Impact Statement, U.S. Army Alaska (USAG Alaska, 2004).

Other Projects and Right-of ways

The Northern Intertie Project involves the installation of a 230 kV transmission line near the northeast boundary of Tanana Flats Training Area. The transmission line has a right-of-way of 150 to 300 feet wide and 90 to 170 miles long. The Trans-Alaska Pipeline System right-of-way extends through Yukon Training Area. Its width is 50 feet plus the ground area occupied by the pipeline. The 50 –foot wide Alaska Natural Gas Transportation right-of-way lies adjacent to the pipeline. The Army and BLM approved an additional right-of-way for the Trans-Alaska Gas System which will run parallel to the existing pipelines.

Large parts of land on Fort Wainwright are devoted to large scale environmental remediation projects under CERCLA, especially in the Cantonment area. These areas will limit the amount of construction that can occur in support of facilities, recreation and roads.

4.8.13.2 Environmental Consequences

CS (1,000), CSS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. Construction that would occur as infill (1,000 Soldier stationing scenarios) may impact structures that contribute to the National Historic Landmark (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.

Construction to accommodate more than 1,000 Soldiers at FWA would occur in an area roughly 75 to 150 acres in size to the north of the existing cantonment area or to the southeast of the main cantonment area. There may be short-term effects to land use compatibility from construction noise and from activities that create dust.

Training Range Infrastructure Construction. Range expansion and construction projects would occur either in the footprint of existing ranges, or in pre-disturbed areas nearby current ranges. Siting of new ranges would involve minimizing conflicts with existing land uses. Range surface danger zones may preclude some existing land use during range operations, but no impacts are anticipated during construction.

Live-fire Training. Live-fire activities would increase in frequency at FWA. The additional live-fire training at FWA ranges would not conflict with recreational areas as the restricted live-fire areas are adjacent to limited use areas and modified use areas.

Maneuver Training. The increase in maneuver training frequency may result in some restrictions on public access; however, when not used for training, military lands will be made available for public recreation.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

1 *Training Range Infrastructure Construction.* Construction would be required in support of the
2 Fires Brigade (addition of new firing points). This level of expansion may occur on top of pre-
3 disturbed areas minimizing conflicts with existing land uses. Range surface danger zones may
4 preclude some existing land use during range operations, but no impacts are anticipated during
5 construction.
6

7 *Live-fire Training.* No new weapon systems would be introduced as a result of any of these
8 stationing scenarios; however, the frequency in live-fire events, including the use of large caliber
9 munitions, would increase. No changes to land use designations within existing ranges or
10 impact areas are expected. Increased noise, dust, or other indirect effects associated with these
11 stationing scenarios are not expected to affect off-post land uses. Conflicts with some
12 recreational activities such as hunting could occur due to an increase in restrictions during
13 training activities. The surrounding areas are uninhabited federal lands and few residential
14 areas, schools, hospitals, or businesses are expected to be affected.
15
16

17 **Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area**

18
19 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).**
20

21 *Maneuver Training.* Due to the increase and intensity of training, more limitations may be
22 imposed on public access to open use areas and recreational areas. Due to the current
23 seasonal training limitations, and because maneuver requirements for these stationing
24 scenarios would increase the level of training at interior Alaska training sites by 10 to 60
25 percent, the addition of any of these stationing scenarios would also drive increases of
26 summertime maneuver training requirements, as less areas would be available for training due
27 to unfrozen soil conditions. During winter, access to maneuver areas would improve (ability to
28 construct ice bridges and frozen soil conditions) and the additional acreage would be more than
29 sufficient to accommodate training requirements. Impacts associated with public access
30 closures are expected to be minor because alternate areas at these training areas would still be
31 available for recreational and subsistence activities.
32
33
34

35 **4.8.14 Hazardous Materials/Hazardous Waste**

36 **4.8.14.1 Affected Environment**

37
38 Fort Wainwright is registered with EPA as a Large Quantity Generator of hazardous waste in
39 accordance with the Resources Conservation and Recovery Act (RCRA). There is no treatment
40 facility on-site and all hazardous waste generated at the installation is stored and removed from
41 the installation within 90 days. Hazardous waste at FWA is primarily generated from vehicle
42 maintenance and facilities operations. Hazardous materials include petroleum-contaminated
43 absorbent pads, batteries, light ballasts, mercury containing bulbs, oils and fuels, compressed
44 gas, lead-based paints, paint thinners and solvents, pesticides, solvents and degreasers, and
45 non-recyclable transmission fluid. Proper management and disposal of hazardous
46 material/waste is completed in accordance with USAG Alaska PAM 200-1 Hazardous Materials
47 and Regulated Waste Management (May 2000).
48

49 FWA was listed on the EPA National Priorities List on 30 August 1990, under CERCLA of 1980
50 (Superfund). In 1992 the Army, EPA, and ADEC signed a Federal Facility Agreement requiring
51 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 their 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 material 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.

Ammunition, Live-fire, and UXO: TFTA, YTA, and DTA impact areas include a two-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 unexploded ordnance.

Petroleum, Oil, and Lubricants: 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. These tanks are equipped with electronic monitoring devices that are designed to detect leaks and overfill. USTs are double-walled and are monitored monthly. Hazardous wastes are also generated during field training exercises (from vehicle maintenance, accidental spills, etc).

Installation Restoration Program (IRP): Fort Wainwright has a large amount of land that is devoted to large scale remediation projects. Due to past contamination on Main Post, Fort Wainwright has been classified as a Comprehensive Environmental Response, Compensation, and Liability (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 FWA for cleanup, 38 were identified as Superfund operable units (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 one site is currently being investigated (USAG Alaska, 2004).

Lead: Many of the Family housing units on the installation were surveyed for lead-based paint. 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 Fort Wainwright contain some asbestos. While few surveys have been conducted on the installation, they are conducted prior to any renovation or demolition work. Asbestos, during these surveys, 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 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 found to be at acceptable levels (below 4 pCi).

Hazardous Wastes/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.

4.8.14.2 Environmental Consequences

CS (1,000), CSS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Significant but Mitigable).

Cantonment Construction. Long-term effects are anticipated. Construction and demolition of structures within the cantonment area (supporting the 1,000 Soldier stationing scenarios) would generate hazardous waste due to the presence of asbestos and lead 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.

A scenario of 3,000 Soldiers would require the construction of additional motorpools that may potentially double the amount of hazardous material storage needs. The additional tactical and fleet vehicles may require additional ASTs/USTs, wash racks, and oil-water separators. Additionally, more vehicles would increase the potential for spills or releases of hazardous materials to the environment.

The increase in Soldiers from all of these stationing scenarios would result in the generation of biomedical wastes from dental and medical facilities on-post. These wastes would be processed in accordance with current standard operating procedures and regulations. Because the installation is already considered a Large Quantity Generator no additional permitting or significant actions are likely to be required.

Training Range Infrastructure Construction. Short-term effects are anticipated from the upgrade of existing ranges and the construction of new ranges to accommodate growth. These ranges 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 Alaska policy, all spills are to be cleaned up immediately and proper reporting requirements followed.

Live-fire Training. Long-term effects are expected. These scenarios would increase the frequency of Soldier live-fire training ranges; 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 a great deal 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.

DUD and UXO items may also be produced from the use of the MK-19 grenade machine gun. These items produce a hazard on ranges if not immediately disposed of. Additionally, activities supported by combat engineers or EOD units may train with explosive material. The use of explosive material would be consistent with current uses, and would not pose a significant impact to human health or the environment as these materials would be expended, stored, or disposed of in accordance with all appropriate safety regulations.

No new weapon types would introduced to FWA training areas. Handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations.

Beneficial effects would occur from the recycling of brass shell casings expended at firing ranges.

Maneuver Training. 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 to the environment. Best management practices would continue to be exercised throughout the garrison. Fort Wainwright'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 Alaska PAM 200-1.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).

Training Range Infrastructure Construction. Short-term effects may be expected from the construction of new firing points to accommodate the Fires Brigade training. Construction equipment operating in the potential construction area would increase the chance of spills of POL to the environment. In accordance with USAG Alaska Hazardous Waste Policy, spills would be identified and cleaned immediately to minimize the effects to the environment.

No additional construction is anticipated to accommodate CSS or CS units.

Live-fire Training. Long-term effects are expected. These scenarios would increase the frequency of Soldier live-fire training on ranges DTA, 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 a great deal 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.

Use of artillery and rockets (associated with the HIMARS) is anticipated to contribute to an increase in UXO and explosives materials within the impact area. While these impacts would be long-term, they are minor because these materials would be localized to the impact area.

1 Additionally, although some ordnance casings would be recycled by the garrison, some casings
2 may not be recyclable depending on the types of munitions constituents that may be left as
3 residual on the casings.

4
5 The training area is currently operating as a small quantity generator and is conditionally exempt
6 (for the generation of hazardous material under 120 pounds per month). The additional shell
7 casings generated from a Fires Brigade may cause the training area to exceed this status.

10 **Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area**

11 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CS (3,000), CSS (3,000): (Minor).**

12
13
14 *Maneuver Training.* Transportation of personnel and use of flammable or combustible
15 materials, such as fuel or ordnance (i.e., weaponry or equipment), could increase the potential
16 for spills or releases of hazardous materials to the environment. Best management practices
17 would continue to be exercised throughout the garrison. Fort Wainwright's existing programs,
18 management plans, and regulations that govern handling, use, storage, and disposal of
19 hazardous and non-hazardous materials would remain in place. All spills should be cleaned
20 immediately in accordance with USAG Alaska PAM 200-1.

24 **4.8.15 Traffic and Transportation**

25 **4.8.15.1 Affected Environment**

26
27 Fort Wainwright has two primary roads that lead onto the installation, with four main roads and
28 numerous secondary roads used for transportation on the installation.

29
30 The transportation services available to DTA (and Delta Junction) include the Richardson and
31 Alaska Highways and Allen Army Airfield. The highways both have two lanes and undergo
32 year-round maintenance. The State has recently (in 2007) constructed several passing lanes
33 on the Richardson Highway between Fairbanks and Delta Junction specifically to help alleviate
34 traffic issues with convoys running between Fort Wainwright and DTA.

35
36 Military convoy traffic can be a nuisance concern on state highways and may occasionally be
37 perceived as severe enough to be a potential human health and safety risk. Military convoys are
38 most common between FWA Main Post and YTA or DTA. Army convoys are subject to a
39 permitting process in conjunction with the Alaska Department of Transportation. Large convoys
40 are broken up into smaller components called serials, consisting of no more than 20 vehicles
41 with 20 to 30 minute gaps between departures to reduce traffic impacts. Highway speeds
42 cannot exceed 40 miles per hour.

43
44 The Alaska Railroad provides rail service to Fort Wainwright. The main line passes through the
45 central cantonment area, with spur tracks serving the central heating and power plant and
46 warehouse circle. DTA has no rail service.

47
48 Aviation is an essential component of transportation in the Fort Wainwright region. The civilian
49 community utilizes Fairbanks International Airport. Fort Wainwright has its own airfield and also
50 uses nearby Eielson Air Force Base for large-scale deployments. Both military air fields can

support any type of military aircraft. Wainwright Army Airfield has one active runway; several ancillary taxiways, and hangars. The runway is classified as Class D Airspace.

4.8.15.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Less than Significant to Significant but Mitigable).

Cantonment Construction. Short-term effects are expected to be temporary. Construction equipment and worker vehicles would have short-term impacts at the main gate and at the roads around the designated construction site. Traffic patterns on post may need to be further evaluated in support of the 1,600 and 3,000 Soldier stationing scenarios.

Long-term effects would be expected from the increase in military fleet vehicles and POVs, potentially causing flow issues at the Main Gate entrance to the installation. With these scenarios the Soldier population would increase by 25 to 50 percent. 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 will help to alleviate congestion as a result of current seasonal traffic conditions. A traffic study may need to be considered.

Training Range Infrastructure Construction. Short-term effects from construction equipment in the range areas are anticipated. The action would temporarily increase construction traffic to construction sites, effecting flow at the front gate, on the cantonment area, and potentially the communities surrounding the installation.

Live-fire Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic. Impacts would be expected on local highways from military convoys.

Maneuver Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic. Impacts would be expected on local highways from military convoys.

Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).

Training Range Infrastructure Construction. A majority of construction vehicle traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic.

Live-fire Training. No new range roads or trails would be considered for construction outside existing training areas. A majority of military traffic would be designated on military roads and trails, therefore military traffic would not interfere with civilian traffic. Impacts would be expected on local highways from military convoys.

Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).

Maneuver Training. There is adequate maneuver space and road network available at DTA to accommodate any of these Soldier stationing scenarios. Impacts would be expected on local highways from military convoys. Effects to traffic on the Glenn, Parks, and Richardson Highways are likely to be short-term because in order to meet training requirements these units would travel to DTA only a few times per year. The garrison enforces a convoy procedure permitting groups of vehicles (or serials). Following this procedure reduces the impact to traffic on these major Highways.

4.8.16 Socioeconomic

4.8.16.1 Affected Environment

FWA is located within the Fairbanks North Star Borough (FNSB), which according to the U.S. Census Bureau 2006 population estimate has a total population of 86,754. The FNSB region includes the municipalities of Fairbanks and North Pole. Doyon, Ltd. serves as the regional Native Corporation for the area that is subject to the Alaska Native Claims Settlement Act. A list of the village corporations in that area can be found in the Transformation of the U.S. Army Alaska Final EIS (USAG Alaska, 2004). According to the U.S. Census Bureau, the average labor force is estimated at 46,125 with a projected median household income of \$58,833 (U.S. Census Bureau Web Site, n.d.). The unemployment rate as of December 2004 for the FNSB was 6.0 percent, which is 1.3 percent lower than the state average and 0.5 percent higher than the national average.

In 2005, the Army commissioned a Housing Market Analysis of assets on Fort Wainwright 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). The growth covered by this market analysis does not include potential growth associated with the proposed action (Robert D. Niehaus, Inc, August 2005).

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 United States. There are no roads leading west from Fairbanks. Health care services are provided by two hospitals and several clinics, and from Bassett Army Community Hospital on FWA.

The schools in and around Fairbanks have a lower student-to-teacher ration 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 ~30 percent of the operating budget in the municipal areas).

DTA is located within the Southeast Fairbanks Census Region and includes the community of Delta Junction and the villages of Dot Lake, Healy Lake, Tok, Northway, Tanacross, and Tetlin. These areas are minimally impacted by military activities conducted at installations in central Alaska. Doyon, Ltd. serves as the regional Native Corporation for the area that is subject to the Alaska Native Claims Settlement Act. A list of the village corporations in that area can be found in the Transformation of the U.S. Army Alaska Final EIS (USAG Alaska, 2004). Nearby Fort Greely was historically the largest single employer in the region, but was dramatically reduced by BRAC in the 1990s. The Census Bureau estimated in 2000 a population of approximately 840 with a 26 percent housing vacancy rate. The estimated per capita income is \$19,171, compared to the median household income of \$43,500; there is also more than 160 persons estimated to be in poverty.

The Delta-Greely School District has a higher student-to-teacher ratio and lower expenditures per student than Fairbanks, and does not have the tax base that Anchorage or Fairbanks have to supplement state educational expenditures, therefore less money is spent per student. Because the population of Delta Junction and the surrounding communities is somewhat dispersed the area does not have the public facilities that are available in larger metropolitan areas. However, some medical services are provided by the Delta Junction Family Medical Center.

4.8.16.2 Environmental Consequences

CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Significant but Mitigable to Significant Adverse).

A preliminary socioeconomic analysis of potential effects was conducted for each of the stationing scenarios identified to be suitable for USAG Alaska. This includes the potential stationing 1,000 or 3,000 Soldiers as a result of Army Growth activities. The results of this analysis can be found in Appendix A of this document.

The increase in unit strength would also have an increase in school enrollment. As indicated above the FNSB 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. The addition of 3,000 Soldiers may add approximately 745 school-aged children to local schools. It is anticipated that the school system would be able to absorb this level of student growth.

According to the 2005 housing analysis conducted by 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 be able to absorb growth.

Combined, the Army and Air Force presence exceeds 30 percent of the FNSB population and is a very influential economic driver in the region. Growth at FWA would to be coordinated with the local communities, villages, and the FNSB.

The addition of unit strength may also drive some limited economic stimulus in the local economy. There may be a need for civilian employment and the additional Soldiers and their Family members would slightly increase the business volume in Fairbanks.

1 New units would likely contend with a higher cost of living than what they may normally be
2 accustomed to at other stationing locations. For example, much of the food available in the
3 winter at Fairbanks must be imported from outside central Alaska. The cost of electricity is also
4 much higher in the FNSB than many other locations around the United States.

5
6 *Cantonment Construction.* Construction of new facilities at FWA would have a beneficial short-
7 term effect to the local commercial construction contractor market. The requirement for new
8 facilities equates to MILCON funding being spent on commercial services which could in-turn
9 improve employment outside the installation boundaries.

10
11 *Training Range Infrastructure Construction.* Short-term beneficial effects are expected.
12 Construction of ranges would have a temporary beneficial effect from an increase in military
13 spending on commercial goods and construction services; therefore resulting in a positive
14 influence to employment and income.

15
16 *Live-fire Training.* No impact.

17
18 *Maneuver Training.* No impact.

19 20 21 **Donnelly Training Area**

22
23 **CSS (1,000), CS (1,000), Fires Brigade (1,600), CSS (3,000), CS (3,000): (Minor).**

24
25 *Training Range Infrastructure Construction.* Short-term beneficial effects are expected.
26 Construction of ranges would have a temporary beneficial effect from an increase in military
27 spending on commercial goods and construction services; therefore resulting in a positive
28 influence to employment and income.

29
30 *Live-fire Training.* No impact.

31
32
33 **Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area: (Minor).**

34
35 *Maneuver Training.* No impact.

4.9 Cumulative Effects for USAG Alaska

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.

Past and present actions are accounted for in the description of the affected environment for each resource. Past, present, and reasonably foreseeable future actions were identified as contributors to cumulative effects in the FRA, FWA and USAG Alaska region of influence. Past and present actions include the construction of projects identified in the 2004 EIS for Transformation of U.S. Army Alaska; the 2005 Final Programmatic EA for Modularization of Army National Guard Forces; the Final BAX/CACTF EIS and Airborne BCT EA; the 2007 Final EA for Construction and Operation of a Railhead Facility and Truck Loading Complex, Fort Wainwright, Alaska; and the 2008 Draft EA for Donnelly Training Area East Mobility and Maneuver Enhancement, Fort Wainwright, Alaska. Future actions include south central Alaska (FRA) and interior Alaska (FWA, TFTA, DTA, and YTA). This cumulative impact analysis also considers past and present, and reasonably foreseeable future actions that occur as part of other federal, state, and local projects outside of army actions.

Table 4.9-1 compares the cumulative impacts of various stationing scenarios at FRA and FWA. The impact table captures the cumulative impact that would occur if the Army decided to implement different stationing scenarios at each of these installations or at both of these installations simultaneously. Cumulative effects ratings listed in Table 4.9-1 are composite ratings that include the impacts at DTA, YTA, and TFTA that would occur as a result of implementing stationing at FWA and FRA. In other words, the cumulative impact rating of each column takes into account the impact of stationing both at the home-station site (FRA and FWA) and the maneuver training sites.

The cumulative impact section assesses the impact of stationing up to 6,000 additional Soldiers in Alaska which is the greatest possible increase in Soldiers that could result from Army stationing as a result of this analysis. This scenario would be possible if the Army decided to station 3,000 additional Soldiers at FWA and 3,000 additional Soldiers at FRA.

Table 4.9-1. Cumulative Effects for Stationing Scenarios in Alaska

VEC	Location										
	FRA / FWA 1,000 CS/CSS*		FRA / FWA 3,000 CS/CSS*		FRA/FWA Fires Brigade*		FRA / FWA 4,000 CS/CSS*		FRA / FWA 6,000 CS/CSS		No Action
Air Quality	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Airspace	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○
Cultural Resources	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Noise	⊙	⊙	⊙	⊙	⊗	⊗	⊙	⊙	⊗	⊗	○
Soil Erosion	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Biological Resources	⊗	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Wetlands	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Water Resources	⊙	⊙	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Facilities	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Energy Demand / Energy Generation	⊙	⊗	⊙	⊗	⊙	⊗	⊙	⊗	⊙	⊗	○
Land Use Conflict / Compatibility	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Hazardous Material / Hazardous Waste	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Traffic and Transportation	⊙	⊙	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	○
Socioeconomics	+		+		+		+		+		+

⊗ = Significant Adverse

+ = Beneficial Impact

⊗ = Significant but Mitigable

N/A = Not Applicable

⊙ = Less than Significant

○ = Minor or No Impact

* Cumulative Impacts Assessments include impacts to DTA, YTA and TFTA that would result from stationing at FWA or FRA.

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The Army is currently preparing an environmental impact statement to assess the potential impacts associated with the resumption of year-round live-fire weapons training at Fort Richardson's Eagle River Flats impact area (ERF). The successful cleanup of white-phosphorus-contaminated sediment over the last ten years has resulted in a potential opportunity for the Army to resume year-round use of the impact area. This area is currently available only when ice cover is of sufficient thickness to prevent sediment disturbance resulting from use of high explosive mortar or artillery munitions.

In south-central Alaska, about 11 past, present, and reasonably foreseeable future actions were identified for the FRA area. They include management of Nike Site Summit, USARAK Mission-Essential Projects, and other military and non-military projects:

- Cantonment Area Projects at Fort Richardson
- Stationing of the Airborne Brigade Combat Team (ABCT) at FRA
- Rapid Deployment Facility (completed)
- Ammunition Supply Point Upgrade (completed)
- Whole Barracks Renewal (completed)
- Range Upgrade and Expansion Projects at Fort Richardson (completed)
- Mission Operations on Urbanized Terrain (MOUT)
- Sniper Range (completed)
- Multi-purpose Training Range (completed)
- Installation Boundary Fence Project (completed)
- U.S. Air Force (Elmendorf AFB) - 13,130 acres to the west of FRA and north of the Municipality of Anchorage (construction associated with the stationing the F22 aircraft)
- Year-round training at Eagle River Flats (in progress)

A variety of past, present, and reasonably foreseeable future actions were also identified for interior Alaska (FWA, DTA, TFTA, and YTA). They include USAG Alaska mission-essential projects:

- Additional Cantonment Construction Projects at FWA
- Stationing of the Stryker Brigade Combat Team (SBCT) at FWA
- Range Upgrade and Expansion at FWA (completed)
- Collective Training Range at DTA (completed)
- Cold Regions Test Center Automotive Test Complex at DTA (completed)
- Space and Missile Defense System at DTA (completed)
- U.S. Air Force (Eielson AFB) aircraft stationing actions (completed)

In addition, a number of other future military projects were identified, including:

- ITAM Projects
- FWA Housing Projects
- Aviation Task Force Construction (proposed)
- Proposed Addition of OH-58D Kiowa Warrior Helicopters (proposed)
- Range Operations Center (completed)
- C-17 Landing Strip
- Direct Fire Range
- USAF Training – Airspace
- Pacific Area Range Complex
- DTA East Mobility and Maneuver Enhancement Projects
- DTA West Winter Trail Improvement
- RCI
- Utilities Privatization

Other future non-military activities and projects were also identified for both regions of Alaska:

- Community Development at Fairbanks, North Pole, and Delta Junction
- Alaska Railroad Expansion
- ARRC Fort Wainwright Realignment Project
- Tanana River Bridge
- Bureau of Land Management (BLM) Alaska Fire Service Campus Upgrades
- Natural Gas Pipeline
- Richardson Highway Upgrade
- Richardson and Alaska Highways
- Delta Agricultural Project
- Multiple use land management under the Tanana Valley Management Plan
- Subsistence on public and private lands
- Recreation on public and private lands
- Knik Arm Bridge

Some of these actions are ongoing projects that would continue into the future, while others would be expected to be completed in the reasonably foreseeable future. The following sections describe the cumulative impacts to each environmental resource that would be expected to result if additional Soldiers were stationed at USAG Alaska.

Air Quality

The city of Anchorage is classified as a non-attainment area for CO, and the Eagle River area outside of Anchorage is in a non-attainment area for PM₁₀. FRA is not within either of these non-attainment areas; however, these pollutants are the main issues of concern in the larger south-central airshed within which FRA resides.

Historically, Anchorage has also been listed among the top ten air quality regions of concern in the western United States for CO. The largest source of CO emissions is motor vehicles (83.6 percent), followed by aircraft (8.6 percent). Most exceedances to the CO NAAQS occur on weekdays when vehicle traffic is the heaviest. Morning starts of vehicles, or "cold starts," are believed to be the leading cause of high CO levels during winter months (Municipality of Anchorage 1999). Vehicle emissions have decreased significantly in recent decades due to the requirement for emission control equipment on all new vehicles manufactured since 1981. In 1995, Anchorage adopted an Air Quality Control Plan to reduce CO emissions by using oxygenated fuels, increasing vehicle inspection requirements, and implementing a ride-sharing program.

PM₁₀ is high in Eagle River due to the number of unpaved roads. Over 90 percent of the particulate matter in the area is generated by travel on paved and unpaved roads. Only 10 percent of the fugitive emissions result from industrial sources, wood stoves, or automobile exhaust (Municipality of Anchorage 1999). In 1987 a plan was implemented to pave or surface gravel dirt roads in the area. The state of Alaska modified winter road maintenance practices in the Anchorage and Eagle River areas to reduce the amount of traction sand on the road. Traction sand is believed to contribute to higher PM₁₀ levels. No exceedances of the PM₁₀ standard have occurred since 1987 (Municipality of Anchorage 1999).

Major stationary emission sources in the area include power plants, standby power generating facilities, exhaust emissions from vehicle maintenance shops, small space heaters, and dry cleaning and petroleum storage facilities.

Air quality in the DTA region is assumed to be near baseline conditions due to the low density of human development and emission sources. This training area is in attainment for all criteria air pollutants. Ice fog forms under the same conditions at this location as in FWA, but the duration of the episodes at DTA are generally shorter. Temperature inversions do occur, but due to the limited number of emission sources, the inversions are not likely to cause CO levels to exceed the NAAQS.

Major emission sources at DTA include vehicles and the burning of fuels, including wood, gasoline, diesel oil, and fuel oil. Fugitive dust, forest fire smoke, and the occasional use of helicopters and aircraft were also cited as sources of emissions at DTA. Other currently planned USAG Alaska mission-essential projects would contribute only short-term and relatively small cumulative effects to air quality.

Mission-essential construction projects planned for DTA include the construction of a battle area complex and combined arms collective training facility (BAX/CACTF) and would result in the generation of temporary emissions. Air quality impacts from the BAX/CACTF are essentially negligible. The primary source of impaired visibility is local wildfires and naturally-generated fugitive dust during high winds (Army 2006).

Cumulative air quality impacts at FWA would occur from cantonment construction projects within the same geographic area and from motor vehicles. Fairbanks is classified as a CO maintenance area. Cumulative impacts to air quality would also be expected from maneuver training at TFTA, YTA, and DTA. These impacts include the increase in vehicle emissions on ranges, and an increase in dust and opacity. Regionally, the effects of military training is largely localized to the training area.

Estimates of baseline air emissions from aircraft operations were calculated for Eielson AFB. Pollutant concentrations from aircraft operations would constitute a small percentage of the NAAQS, thus, no appreciable effects to air quality would result.

Construction of the Cold Regions Test Center Automotive Test Complex would result in temporary release of air pollutants from the combustion of fuel and from dust. Use of test facility buildings and testing of vehicles on the paved track would also result in increased emissions; however, the need for additional air quality permits is not expected.

The addition of new permanent, stationary air emission sources by the Space and Missile Defense System on the Fort Greely cantonment area would affect the overall ambient air quality within the airshed. This project has been issued a construction permit by the ADEC, and construction is underway. The air quality effects may increase if the test bed evolves into a full missile defense system.

The Trans-Alaska Pipeline (TAPS) Renewal Project could affect ambient air quality. The maximum estimated concentrations of criteria air pollutants associated with the TAPS activities have been found to be below applicable NAAQS. HAPs concentrations would contribute little to the background concentrations already found in residential areas. There are no predicted adverse effects to visibility expected to occur because of TAPS. Some of the projects identified as contributing to cumulative impacts would occur in or adjacent to areas where wildland fires could occur.

The cumulative military projects are expected to contain mitigation measures to minimize potential environmental impacts involving wildfires that can also contribute to air quality impacts. The FRA, FWA or Fort Greely Fire Department provides the initial response for wildfire suppression. Cumulative fire management impacts to the region would mainly result from the addition of new firing ranges, and expansion of existing or development of new maneuver areas, and population growth in the forested areas bordering installations.

Stationing additional CS, CSS, or Fires Brigade units in Alaska would produce greater emissions of carbon dioxide and other greenhouse gasses from both the use of explosives and the operation of vehicle engines. The Army is proactively working to reduce its overall consumption of energy and fossil fuels at all of its installations. As a result the Army anticipates the cumulative effect of military and nonmilitary actions to be less than significant.

Airspace Resources

Increasing aircraft operations may create cumulative effects to airspace under these stationing scenarios, especially under the Fires Brigade stationing scenario. Reasonably foreseeable future actions identified near FRA, FWA, and DTA may cause direct and indirect effects that could overlap in time and space with the effects of this alternative. Upgrades and expansion at Elmendorf AFB near FRA and at DTA and Eielson AFB may result in impacts that could also cumulatively contribute to airspace effects. If constructed at DTA as planned, the C-17 landing

1 strip would increase the number of flights in DTA's airspace. In addition, upgrades and
2 expansions are expected for Elmendorf and Eielson AFBs. Depending upon the specifics of
3 these upgrades and expansions, they could cause cumulative impacts when their effects are
4 combined with the airspace impacts of this alternative. Appropriate coordination and planning
5 among the Air Force, Army, and Federal Aviation Administration is expected to keep any
6 cumulative effects to a level that is less than significant.
7

8

9 **Cultural Resources**

10
11 Military and non-military activities can affect cultural resources in a number of ways. The nature
12 of cultural resources makes any impact potentially irreversible or irretrievable. Because cultural
13 interactions with the landscape are regional in scope, cumulative impacts to cultural resources
14 are also regional.
15

16 Past activities on USAG Alaska lands, such as range construction and modification, creation of
17 roads and trails, and maneuver training, have impacted cultural resources. Current and future
18 military activities and projects, such as training activities and construction, would also impact
19 cultural resources. Activities outside DTA, such as oil and natural gas exploration and
20 extraction, development of transportation and communication corridors, timber harvesting and
21 mining, and the growth and development of communities, would cumulatively impact the
22 regional cultural resource base.
23

24 Past military activities, such as range construction and modification, creation of roads and trails,
25 and maneuver training on FRA, have also impacted an unknown number of cultural resources.
26 However, given the low number of prehistoric sites found on FRA, this impact has probably
27 been minor. Unsympathetic uses of the buildings and structures that make up either the unlisted
28 eligible historic district that encompasses part of the FRA cantonment area, or the Nike Site
29 Summit historic property, including modification or demolition of relevant structures, would also
30 have impacted cultural resources. Similarly, present and future actions would have an impact on
31 archaeological sites, but may also involve modification or destruction of eligible historic buildings
32 and structures. Cultural resources in the region have been and will continue to be impacted by
33 highway and railroad construction, oil, gas, and mining exploration, and real estate development
34 outside FRA. Growth and development of Anchorage and smaller communities in the region
35 also impact the region's cultural resources.
36

37 Cumulative effects at FWA's main post are anticipated under all stationing scenarios to be
38 significant but mitigable to less than significant. An historic district and National Historic
39 Landmark are located on the main post of FWA. Individual construction projects have the
40 potential to impact cultural resources on the installation. As the installation continues to
41 coordinate with the SHPO these potential effects could be mitigated to less than significant.
42

43 Management of cultural resources at locations in Interior Alaska and FRA under their respective
44 ICRMPs can mitigate the contribution to cumulative impacts by implementation of Army growth
45 through the identification, evaluation, and management of cultural resources. The protection of
46 sites that can be avoided and data recovery on those that cannot be avoided would mitigate
47 potential cultural resource impacts, but there is a possibility the proposed action would impact
48 known or unknown cultural resources, a cumulative impact that cannot be mitigated to less than
49 significant.
50
51

Noise

Cumulative noise impacts would result from both non-military and military actions in the area. Noise contributed by the local community includes transportation, construction, and recreation in the Anchorage vicinity.

The noise of existing and planned military training include firing and detonation of munitions, low-flying aircraft, construction activities and general troop maneuvers (both mechanized and pedestrian). Numerous studies have indicated that the introduction of noise into previously undisturbed areas can initially cause behavioral changes and stress in some species of wildlife. However, over an extended period of time, these effects wane as wildlife becomes accustomed to the recurring disturbance. Observations of wildlife support this general statement that noise is of little significance. Impact from noise on wildlife to not appear to cause population level impacts (USAG Alaska 2004 and 2007).

Construction of mission-essential projects at FRA and FWA would result in increased noise levels, but the effect would be short-term and highly localized. There would be no long-term noise effects from these projects.

Under fires brigade stationing scenarios at both FRA and FWA, firing activities would be conducted at DTA and limited training would add to cumulative impacts of noise in the region of influence surrounding FRA and FWA.

Activities by the U.S. Air Force and the Alaska Air National Guard contribute to adverse noise effects in the Anchorage area, but have taken steps to ease the impact (e.g., flight scheduling) (U.S. Air Force 1995). Elmendorf Air Force Base does receive off-post noise complaints (U.S. Air Force 1995). Cumulative noise effects for stationing additional Soldiers at USAG Alaska would be less than significant to significant but mitigable.

Soil Erosion

Soldier growth is likely to contribute to cumulative impacts from soil erosion near Fairbanks and Delta Junction, which includes DTA, YTA, and TFTA. The major historic influences on soil erosion in the area include 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. The recent trend for soil erosion and/or loss has been improved in recent years by Integrated Natural Resources Management Planning and better management of disturbed lands and application of BMPs. However, activities that disturb or remove vegetative cover are presently occurring or will occur in the reasonably foreseeable future, which will continue to result in greater soil erosion and loss than without these activities. Use of the training ranges is likely to result in continued enhanced wind soil erosion, as well as compaction, rutting, and damage to permafrost in some areas. These effects are expected to be locally significant. However, at the regional level, the effects are not expected to be significant compared to natural rates of erosion and the cumulative impacts caused by other activities in the region.

Soil resources in interior Alaska are likely to be impacted from other military activities associated with USAG Alaska, U.S. Air Force, Cold Regions Test Center, and the Space and Missile Defense System. These activities have the potential to contribute to increased soil erosion, compaction, and rutting, as well as damage to permafrost. USAG Alaska mission-essential

range improvement and upgrade projects could cause negative impacts to soils at DTA (USAG Alaska 2004). Current USAG Alaska maneuver training has involved stream crossings on DTA (USAG Alaska 2004). DTA river crossing training has occurred in winter, which prevents direct sedimentation impacts due to streambed disturbance. However, erosion at the crossing points may lead to soil erosion and subsequent sedimentation through runoff, as well as damage to permafrost. In addition, weapons training involving explosive munitions may also have had impacts to soils through ordnance impact and residual chemical contamination (USAG Alaska 2004). Most other planned military projects will occur on already disturbed areas, such as the cantonment area or impact areas. These projects are sufficiently separated (in time and location) from routine training activities to prevent additive or synergistic impacts to soil.

Infrastructure projects, including the Alaska, Richardson, and Parks Highways and the Trans-Alaska Pipeline System and Northern Intertie project, could contribute to surface runoff and subsequent soil erosion and sedimentation. Future permafrost melting from road construction and use is expected in the region. Impacts would be localized and not result in synergistic regional effects. Future natural gas pipeline construction would disturb area soil and permafrost. Other gas and oil exploration projects would also negatively impact soil resources. Additionally, some resource extraction, such as timber harvesting and mining, can also contribute to increased soil erosion and subsequent sedimentation. Fort Knox, True North, and Pogo gold mines all have an increased potential to disturb local surface soils.

Community development can also affect soil resources. Community growth in the Delta Junction and Big Delta areas could lead to increased overland water runoff soil erosion and subsequent sedimentation from areas downflow of the impervious surfaces. These impacts are considered long-term due to the ongoing nature of such impacts. Use of ORVs has impacted area soils and permafrost in the form of erosion and rutting.

Soil resources management on Fort Richardson is achieved through prevention activities and actual restoration of disturbed areas by implementing BMPs in agreement with industry standard installation storm water prevention techniques. Disturbed areas are restored by both erosion control and streambank stabilization activities, which control installation sources of dust, runoff, silt, and erosion debris to prevent damage to land, water, and air resources; equipment; and facilities (including those on adjacent properties). Relevant BMPs used at Fort Richardson are detailed in the INRMP (USAG Alaska 2007) and in the ITAM Five Year Management Plan (USAG Alaska 2005).

No other cumulative geologic or soils impacts are expected. Overall, cumulative impacts to soils associated with Army growth would be expected to be significant but mitigable to less than significant.

Biological Resources

The projects identified as contributing to cumulative impacts would impact biological resources. The cumulative projects are expected to contain mitigation measures and SOPs to minimize potential biological impacts. In light of historic, ongoing, and reasonably foreseeable future actions, the cumulative impacts involving vegetation, threatened and endangered species, and wildlife and habitat are expected to be less than significant.

Prior activities on Army lands have impacted vegetation, primarily through maneuver training exercises, and construction of ranges and cantonment buildings. Total cantonment area

1 acreage includes approximately 10,230 acres of USAG Alaska lands. Vegetative structure
2 within the cantonment has been heavily altered to accommodate construction of buildings,
3 roads, and other infrastructure. In addition, training ranges on interior Army lands occupy
4 approximately 6,500 acres, which require ongoing vegetative modification. Drop zones and
5 assault strips occupy approximately 4,900 acres on interior lands. These areas must remain
6 free of high-standing vegetation, which prevents the areas from progressing through
7 successional stages.

8
9 Range improvement and upgrade projects and construction at the cantonment area cause some
10 adverse impacts to vegetation at DTA, FWA, and FRA (e.g., Stout 2002a, b). Although
11 additional construction projects would affect vegetation, the impacts to natural vegetation would
12 be less than significant.

13
14 There are no known federally endangered or threatened species on USARAK lands. The Cook
15 Inlet population of beluga whales is proposed to be listed as endangered. Management policies
16 exist and are outlined in the Integrated Natural Resources Management Plan (USARAK 2007).
17 Use of Army lands could contribute to cumulative effects to plants and animal species of
18 concern. Mission-essential construction projects would not affect any species of concern (Stout
19 2002a, b, c). The range construction projects could impact habitats of forest-dwelling bird
20 species of concern at DTA. Non-military projects in the area could contribute to cumulative
21 impacts to sensitive species.

22
23 Wildlife on USARAK lands, including FWA and DTA, has been exposed to military activity for
24 decades. USARAK mission-essential construction projects planned may affect certain
25 individuals or groups of urban wildlife, but probably would not affect any priority species at the
26 population level (Stout 2002a, b). Likewise, the activities planned would not impact priority
27 species (USARAK 2004).

28
29 Of the priority species, range improvement projects at FWA and DTA would not impact grizzly
30 bear habitat, but could compromise about one percent of the preferred habitats of wolverines,
31 wolves, and olive-sided flycatchers. Although one to two percent of current moose habitat could
32 be impacted, range construction could create additional habitat. Range development could
33 compromise about three percent of trumpeter swan habitat in these areas (USAG Alaska 2004).
34 The range improvement projects and subsequent artillery firing at DTA could negatively affect
35 bison that migrate through the battle area complex area, but maintenance of the battle area
36 complex in an early seral state may also benefit bison. The noise could impact waterfowl and
37 other birds in nearby ponds, but the effect of such training is not known. Development and use
38 of the collective training range could affect portions of grizzly bear and sandhill crane habitat in
39 North Texas Range. This area is already used for weapons training. No additional impacts are
40 expected from use of this range to grizzly bears, sandhill cranes, or other species of wildlife
41 (Stout 2002b). Ongoing USAG Alaska activities could negatively impact fisheries primarily due
42 to habitat degradation or loss of water quality. Overall, cumulative impacts to general wildlife
43 and habitat would be less than significant.

44
45 Some of the projects contributing to cumulative impacts would occur in or adjacent to areas
46 where wildland fires could occur. Military projects are expected to contain mitigation measures
47 to minimize potential environmental impacts involving wildfires. The importance of fire for the
48 Alaskan interior ecosystems is recognized but military fires are usually quickly controlled. The
49 FRA, FWA, or Fort Greely Fire Department provides the initial response for wildfire suppression,
50 which has traditionally been confined to areas behind the small arms complex. Cumulative fire
51 management impacts to the region would mainly result from the addition of new firing ranges,

1 and expansion of existing or development of new maneuver areas, and population growth in the
2 forested areas bordering installations.

3
4 There will be some negative additive wildfire impacts expected from the USARAK mission-
5 essential projects planned at FRA (Stout 2002c). The multi-purpose training range, infantry
6 squad battle course, infantry platoon battle course locations were all assessed as wildfire risks.
7 USARAK mission-essential construction, including the multi-purpose training range and infantry
8 squad battle course, are planned for FWA. They would be located between Main Post and the
9 Tanana River. These ranges are described as having risk due to the availability of fuels and
10 past fire behavior (Stout 2002a). The ranges are expected to represent an additive cumulative
11 impact to fire management in the area. In June 2006, the Final Environmental Impact Statement
12 was released for the BAX/CACTF (USARAK 2006). The selected location for the BAX and
13 CACTF facilities was the Eddy Drop Zone in DTA. The SBCT currently stationed at FWA will
14 train at the DTA BAX and CACTF once they are operational.

15
16 Overall, stationing a Fires Brigade, or CS or CSS units at FRA or FWA (with Fires Brigade live-
17 fire ordnance training at DTA) would contribute significantly to cumulative wildfire risk to the
18 region. High-risk areas would be treated to reduce the spread of fire, and training would follow
19 established training protocols.

20
21 Construction noise from new projects in the range areas could temporarily impact wildlife
22 species using these areas for shelter and foraging. Some species of priority, which includes
23 moose, waterfowl, sharp-tailed grouse, and others, could be temporarily driven away due to the
24 construction noise. However, most species would return due to the availability of food and
25 shelter. The frequency and intensity of live-fire training activities would be expected to increase
26 though this level of increase is relatively minor. Although wildlife would adjust to any live-fire
27 training modifications short-term effects are anticipated. These may include the temporary
28 avoidance of live-fire areas and the scattering of smaller mammals when firing is first initiated.

29
30 Live-fire training could potentially increase the frequency of wildfires. Several fire mitigation
31 measures are being implemented throughout the garrison on existing ranges and would be
32 continued under all stationing scenarios.

33 34 **Wetlands**

35
36 Wetland permitting, which is regulated by the U.S. Army Corps of Engineers, would be required
37 if construction were to impact wetlands. U.S. Army range improvement and upgrade projects
38 could cause negative impacts to wetlands at DTA, FWA, and/or FRA. In light of historic,
39 ongoing, and reasonably foreseeable future actions, cumulative impacts to wetlands could be
40 less than significant to significant depending on the specific project and time of year.

41
42 Long-term significant impacts are possible from several of the stationing scenarios unless
43 proper planning/siting occurs. For example, the main post of FWA is made up of approximately
44 42 percent wetlands. Impacts to these areas would depend on siting of new facilities to
45 accommodate growth. Construction could impact wetland areas or surface waters. The
46 removal of vegetation from clearing activities could result in wetland degradation due to
47 increased sediment loading during rain events while construction is taking place. The effects
48 from construction would be less harmful in winter due to the frozen nature of the wetlands, and
49 the snowpack that protects vegetation. Direct and indirect effects could include decreased
50 volume of water flowing to wetlands during low flow seasons; loss of streambank stability, loss

1 of organic matter and habitat that would result in lower productivity; and loss of permafrost that
2 would create thermokarst conditions.

3
4 With proper planning, the installations would site ranges and their firing points away from
5 documented wetland areas to avoid potential impacts. Limited impacts to wetlands would be
6 anticipated. Impacts could occur to wetlands on the range area in the form of munitions
7 constituent loading and sedimentation in wetlands located on Army firing ranges. DTA
8 specifically, could experience increased sediment loading around the BAX training site when
9 wet conditions and off-road maneuver would contribute to sediment loading of surface waters.
10 Training may be averted to TFTA or other areas where more maneuver land would be available
11 (due to a lower presence of wetlands). The availability of training land increases during the
12 wintertime.

13 14 15 **Water Resources**

16
17 USAG Alaska maneuver training has involved stream crossings on Yukon Training Area (YTA),
18 DTA, and TFTA (USAG Alaska 1979a, b). TFTA training occurs mainly in winter, which helps to
19 prevent direct sedimentation impacts due to streambed disturbance, direct impacts to
20 permafrost, and other protective measures. However, erosion at the crossing points may have
21 led to sedimentation through runoff. In addition, weapons training involving explosive munitions
22 may also have had impacts to surface water quality. However, water quality tests have shown
23 no detectable quantities of munitions constituents in recent studies. This indicates that any
24 impacts would be ephemeral at the point and time of impact. Localized contamination from
25 inadvertent chemical releases, such as petroleum, organics, and lubricants, may also have
26 occurred (USAG Alaska 1979a).

27
28 Past impacts to groundwater on Army lands have occurred due to weapons training (USAG
29 Alaska 1979a, b). Explosive munitions training on the TFTA and YTA impact areas has led to
30 the presence of unexploded ordnance on USAG Alaska impact areas. Chemical constituents
31 from unexploded ordnance have the potential to leach through the soil into the aquifer, thereby
32 affecting groundwater quality. However, studies (Houston 2002; Ferrick et al. 2001) indicate that
33 ambient conditions sharply curtail the probability of groundwater contamination from munitions
34 constituents.

35
36 Water resources in interior Alaska are likely to be impacted from military activities including
37 those conducted by USAG Alaska, U.S. Air Force, Cold Regions Test Center, and the Space
38 and Missile Defense System. These activities have the potential to alter surface water quality.
39 The Cold Regions Test Center Automotive Test Complex would be designed to avoid impacts to
40 Jarvis Creek and its floodplain (Stout 2003b). In addition, some resource extraction, such as
41 timber harvesting and mining, can alter surface flow or increase sedimentation. These impacts
42 are generally short-term.

43
44 Construction by any of these can alter groundwater recharge regimes, and such impacts are
45 local and long-term. In addition, disturbance and loss of permafrost can also alter local
46 groundwater flow by increasing connectivity to lower groundwater sources. Military activities
47 also have the potential to affect groundwater quality through munitions practice. These impacts
48 can be long-term. The development and use of the Cold Regions Test Center Automotive Test
49 Complex would not impact groundwater quality, although two wells (approximately 400 feet
50 deep each) would be drilled.

1 Infrastructure projects, including the Alaska, Richardson, and Parks Highways and the Northern
2 Intertie project, can affect surface flow by channelizing flow patterns or altering surface runoff
3 rates by installing impermeable surfaces such as roadway. They can affect groundwater flow
4 long-term by altering permafrost or altering surface recharge rates.

5
6 Oil and gas exploration, extraction, transport, and mining and timber activities also have long
7 and short-term impacts to groundwater resources. The TAPS and Pogo gold mines both have
8 an increased potential to affect local surface and groundwater quality and can alter groundwater
9 flow and recharge. Some management practices do improve surface waters, such as managing
10 for fish and game, or for public recreation.

11
12 Overall, cumulative impacts to water resources associated with Army growth at USAG Alaska
13 would be expected to be significant but mitigable to less than significant.

14 15 16 **Facilities**

17
18 Army growth at USAG Alaska would result in less than significant impacts to facilities, including
19 public services, infrastructure, and utilities. Continued impacts to facilities are expected in the
20 areas surrounding USAG Alaska posts as the result of projected population growth and
21 development. Ongoing USAG Alaska activities, including training and range construction and
22 expansion, are expected to continue to impact facilities. A variety of capital improvement
23 projects are planned or currently underway on installation cantonment areas. In addition, future
24 range construction and improvement projects are planned on USAG Alaska lands.

25 26 27 **Energy**

28
29 Army growth at USAG Alaska is expected to result in less than significant impacts to energy
30 consumption. Continued energy impacts are expected in the areas surrounding USAG Alaska
31 posts as the result of projected population growth and development. Ongoing USAG Alaska
32 activities, including training and range construction and expansion, are expected to continue to
33 impact energy resources. A variety of capital improvement projects is planned or currently
34 underway on installation cantonment areas. The cumulative effects will be less than significant
35 because proposed capital improvement projects would mitigate additional energy requirements.

36 37 38 **Land Use and Recreation**

39
40 Continued population growth and development in the region are expected to create more
41 pressure on existing land use and recreation over time.

42
43 Past, ongoing, and planned military activities would continue to impact public access and
44 recreation or subsistence activities on USAG Alaska lands. Past military activities have
45 impacted public access for recreation or subsistence activities because of permanent and
46 temporary closures of some areas of USAG Alaska lands. Construction of roads and trails on
47 Army properties has resulted in beneficial impacts to public access by increasing the amount of
48 Army lands feasibly accessible for recreational purposes.

49
50 Ongoing USAG Alaska activities, including training and range construction and expansion, are
51 expected to increase the impact to public access and recreation activities. Military training

requires access closures to ensure training viability and public safety. Impact areas must remain permanently off-limits to public access. For live-fire ranges, SDZs are closed for up to 280 days per year, which would have a significant impact to public access. Because alternate areas on USAG Alaska lands would still be available for public access, cumulative impacts would be less than significant.

A variety of capital improvement projects is planned or currently underway within the FRA and FWA cantonment area. Range construction and improvement projects are planned on USAG Alaska lands. Other military activities may also impact land use, public access, and recreation activities in the area.

Ongoing and planned nonmilitary activities would also contribute to cumulative impacts on USAG Alaska lands. Ecosystem-level inventory and planning would promote long-term sustainability of public access and recreation or subsistence opportunities within Alaska. Cumulative impacts to land use and recreation resources are expected to be less than significant.

Additionally, Army growth at USAG Alaska is expected to have less than significant impacts to both access for subsistence activities and availability of subsistence resources. Much of the proposed activities would be located within previously disturbed areas. While there may be an increase in access closures and some less than significant effects on the availability of subsistence resources for some areas at either of the stationing locations, an adequate amount of land would still be accessible for subsistence activities. Subsistence resources may be cumulatively affected because of other regional activities including military activities, resource extraction, and community growth. Impacts to subsistence in the interior Alaska region of interest are expected to be less than significant. As a result of the ever increasing urbanization of south-central Alaska and the affects of federal and state regulations on Subsistence in this region, Army growth is expected to result in less than significant impacts on subsistence.

Hazardous Materials and Hazardous Waste

Stationing of additional Soldiers at USAG Alaska would result from continued development in the region. Increased development in Alaska would result in an increased risk of inadvertent releases of hazardous materials and wastes.

Ongoing Army training activities would continue to use hazardous materials and generate hazardous wastes. Hazardous materials and wastes used and generated on interior USAG Alaska lands would primarily include explosive munitions, fuels, oils, and lubricants. Inadvertent releases of hazardous materials, primarily petroleum products and solvents, have resulted in contaminated sites on USAG Alaska lands. Since the occurrence of UXO/duds is more or less a function of training OPTEMPO, they would be expected to occur at roughly the same or higher relative frequency as current rates. However, all UXO would be contained within the impact areas, which are off-limits to public and most military access. Cumulative impacts to human health and safety are expected to be less than significant to significant but mitigable to less than significant.

Traffic and Transportation

A variety of capital improvement projects is planned or currently underway on installation cantonment areas. In addition, future range construction and improvement projects are planned

1 on USAG Alaska lands. Other military activities may also impact traffic and transportation
2 resources in the area. However, because of the wide distribution of the potential cumulative
3 activities over time and space, cumulative impacts to traffic and transport resources are
4 expected to be less than significant.

6 7 **Socioeconomics**

9 Individually, stationing scenarios potentially affecting FRA or FWA would result in less than
10 significant to significant mostly beneficial impacts to socioeconomic resources. Continued
11 socioeconomic impacts are expected in the areas surrounding USAG Alaska posts as the result
12 of projected population growth and development. Ongoing USAG Alaska activities, including
13 training and range construction and expansion, are expected to continue to impact
14 socioeconomic resources. A variety of capital improvement projects is planned or currently
15 underway on installation cantonment areas. If any stationing scenario were implemented at
16 USAG Alaska, cumulative impacts to population, employment, income, housing, and schools
17 are expected to be less than significant.

18
19 There would be no expected disproportionate impacts to minority or low-income populations or
20 the health and safety of children. Ongoing mission-essential USAG Alaska activities such as
21 construction of ranges and structures, as well as continued use of training lands, may result in
22 impacts to some low-income populations by affecting access to subsistence activities. Steady
23 population growth in the Anchorage and Fairbanks areas may increase the level of recreational
24 hunting and fishing activities, thereby putting pressure on low-income populations dependent on
25 subsistence. Cumulative impacts to low-income populations would be less than significant and
26 would not be expected to cause significant impacts to subsistence activities. Existing and
27 proposed USAG Alaska mitigation measures as previously described would help minimize any
28 disproportionate effects.

29
30 No construction projects or training exercises would take place near schools, daycares, or other
31 areas with large populations of children. No cumulative adverse effects to the health and safety
32 of children are expected under this alternative.

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6.0 ACRONYM LIST

A

AAFES	Army & Air Force Exchange Service
ABN	Airborne
ACM	Asbestos Containing Material
AD	Anno Domini
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
AIRFA	American Indian Religious Freedom Act
AK	Alaska
ALISH	Agricultural Lands of Importance to the State of Hawai'i
AP	Air Pollution
AR	Army Regulation
ARPA	Archaeological Resources Protection Act
AST	Aboveground Storage Tanks
ATC	Air Traffic Control
ATI	Area of Traditional Interest
ATTACC	Army Training and Testing Area Carrying Capacity
AWSS	Aviation Weapons Scoring System
AWWU	Anchorage Water and Wastewater Utility

B

BA	Biological Assessment
BAAF	Bradshaw Army Airfield
BAXs	Ballistic Accuracy Extreme System
BCT	Brigade Combat Team
BLM	Bureau of Land Management
BMP	Best Management Plan
BP	Before Present
BRAC	Base Realignment and Closure

C

CAA	Clean Air Act
CACTF	Combined Army Collective Training Facility
CALFEX	Combined Arms Live Fire Exercise
CCDs	Census County Divisions
CFA	Controlled Firing Area
CFR	Code of Federal Regulations
CHPPM	Center for Health Promotion and Preventative Medicine
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COE	Corps of Engineers
COFs	Company Operations Facilities
CONUS	Continental United States
CPQC	Combat Pistol Qualification Course

1	CS	Combat Support
2	CSS	Combat Service Support
3	CU	Copper
4	CWA	Clean Water Act
5		
6	D	
7		
8	dBA	Decibels
9	DLNR	Department of Land and Natural Resources
10	DMR	Dillingham Military Reservation
11	DoD	Department of Defense
12	DOT	Department of Transportation
13	DPW	Department of Public Works
14	DRMO	Division Resource Management Office
15	DTA	Donnelly Training Area
16	DU	Depleted Uranium
17	DuSMMoP	Dust and Soils Mitigation Monitoring Plan
18		
19	E	
20		
21	EOD	Explosive Ordnance Disposal
22	EIFS	Economic Impact Forecasting System
23	EIS	Environmental Impact Statement
24	EPA	Environmental Protection Agency
25		
26	F	
27		
28	FAA	Federal Aviation Administration
29	FNSB	Fairbanks North Star Borough
30	FRA	Fort Richardson, Alaska
31	FWA	Fort Wainwright
32	FY	Fiscal Year
33		
34	G	
35		
36	GVEA	Golden Valley Electric Association
37		
38	H	
39		
40	HDBEDT	Hawai'i Department of Business, Economic Development and Tourism
41	HDLNR	Hawai'i Department of Land and Natural Resources
42	HDOT	Hawai'i Department of Transportation
43	HE	High Explosive
44	HECO	Hawaiian Electric Company, Inc.
45	HELCO	Hawaiian Electric and Light Company
46	HI	Hawai'i
47	HIMARS	High Mobility Artillery Rocket System
48	HINHP	Hawai'i National Heritage Program
49	HMX	Cyclotetramethylene-tetranitramine
50	HRMA	Housing Requirements Market Assessment

HSDH Hawai'i State Department of Health

I

IBCT Infantry Brigade Combat Team
 ICM Improved Conventional Munitions
 ICRMP Integrated Cultural Resources Management Plan
 ID Infantry Division
 IENMP Installation Environmental Noise Management Plan
 INRMP Integrated Natural Resource Management Plan
 IRP Installation Restoration Program
 ITAM Integrated Training Area Management
 IWFMP Integrated Wildland Fire Management Plan
 IWMP Integrated Wildfire Management Plan

K

KD Known Distance Marksmanship Range
 KLOA Kawaihoa Training Area
 KTA Kahuku Training Area
 kV Kilovolt
 kVA Kilovolt ampere
 kW Kilowatt

L

LBP Lead-Based Paint
 LRAM Land Rehabilitation And Maintenance

M

MCM Multichip module
 MEDEVAC Medical Evacuation
 MFAB Multi-Function Aviation Brigade
 MGD Military Geographic Documentation
 MILCON Military Construction
 MLRS Multiple Launch Rocket System
 MMR Massachusetts Military Reservation
 MOA Military Operations Area
 MOU Memorandum of Understanding
 MP Military Police
 mph Miles per hour
 MPMG Multi-purpose Machine Gun
 MRF Modified Record Fire Range
 MSL Mean Sea Level
 MVA Megavolt ampere

N

NAAQS National Ambient Air Quality Standards

1	NAGPRA	Native American Graves Protection and Repatriation Act
2	NESHAP	National Emission Standards for Hazardous Air Pollutants
3	NHPA	National Historic Preservation Act
4	NO ₂	Nitrogen Dioxide
5	NO _x	Nitrogen Oxide
6	NOV	Notice of Violation
7	NPDES	National Pollutant Discharge Elimination System
8	NPL	National Priorities List
9	NRHP	National Register of Historic Places
10	NWI	National Wetlands Inventory
11	NZ	Noise Zone

O

15	O ₃	Ozone
16	ORAP	Operational Range Assessment Program
17	ORRV	Off-Road Recreational Vehicles
18	OSHA	Occupational Safety and Health Administration

P

22	PAHs	Polycyclic Aromatic Hydrocarbons
23	PCBs	Polychlorinated Biphenyls
24	PEIS	Programmatic Environmental Impact Statement
25	PM	Particulate Matter
26	POL	Petroleum, Oils, Lubricants
27	POV	Power Operated Vehicle
28	PRGs	Preliminary Remediation Goals
29	PSD	Prevention of Significant Deterioration
30	PTA	Pohakuloa Training Area
31	PTRCS	Property of Traditional, Religious, or Cultural Significance

Q

35	QTR	Qualification Training Range

R

39	RCRA	Resource Conservation and Recovery Act
40	RDX	1,3,5-trinitotriazine
41	ROD	Record of Decision
42	ROI	Region of Influence
43	RTLTP	Ranges and Training Land Program

S

47	SBCT	Stryker Brigade Combat Team
48	SBER	Schofield Barracks East Area
49	SBMR	Schofield Barracks Military Reservation
50	SDZ	Surface Danger Zones

1	SHPO	State Historic Preservation Office
2	SMA	Special Management Areas
3	SO ₂	Sulfur Dioxide
4	SO _x	Sulfur Oxide
5	SOP	Standard Operating Procedure
6	SPEIS	Supplemental Programmatic Environmental Impact Statement
7	SPCC	Spill Prevention Control and Countermeasures
8	SRAA	South Range Acquisition Area
9	SRP	Sustainable Range Program
10	STRAC	Standards in Training Commission
11	SVOCs	Semi-volatile Organic Compounds
12	SWPPP	Storm Water Pollution Prevention Plan

T

16	TAMC	Tripler Army Medical Center
17	TCA	Terminal Control Area
18	TCE	Trichloroethylene
19	TCP	Traditional Cultural Properties
20	TFTA	Tanana Flats Training Area
21	TLV	Threshold Limit Value
22	TNT	2,4,6-trinitrotoluene

U

26	U.S.	United States
27	USACE	U.S. Army Corps of Engineers
28	USAEC	U.S. Army Environmental Command
29	USAF	U.S. Air Force
30	USAG-AK	U.S. Army Garrison Alaska
31	USAG-HI	U.S. Army Garrison Hawai'i
32	USARAK	U.S. Army Alaska
33	USARHAW	U.S. Army Hawai'i
34	USARPAC	U.S. Army Pacific
35	USGS	United States Geological Survey
36	UST	Underground Storage Tank
37	UXO	Unexploded Ordnance

V

41	VEC	Valued Environmental Component
42	VFR	Visual Flight Rules

W

46	WAAF	Wheeler Army Airfield
47	WPAA	West PTA Acquisition Area

Y

1	YMCA	Young Men's Christian Association
2	YTA	Yukon Training Area
3		

APPENDIX A: ECONOMIC IMPACT FORECASTING SYSTEM (EIFS) ANALYSIS

Analysis of Socioeconomic Effects for Selected Stationing Alternatives in Hawai'i and Alaska

This analysis is focused on the assessment of socioeconomic effects for three sizes of "notional" combat units (1000 and 3000 troops) in Hawai'i (Schofield Barracks and Fort Shafter) and Alaska (Forts Richardson and Wainwright). The following paragraphs document the use of the Economic Impact Forecast System (EIFS) (Huppertz, Claire E.; Bloomquist, Kim M.; Barbehenn, Jacinda M.; EIFS 5.0 Economic Impact Forecast System, User's Reference Manual; USACERL Technical Report TA-94/03; July 1994), and the Rational Threshold Value (RTV) technique (Webster, R.D.; and Shannon, E.; The Rational Threshold Value (RTV) Technique for the Evaluation of Regional Economic Impacts; USACERL Technical Report TR N-49/ADA055561; 1978).

The EIFS and RTV analyses present a comparative ranking of three alternative "notional units" at the two garrison locations (Hawai'i and Alaska). Some data was not yet available, such as the increase in local expenditures and increased construction in support of these stationing decisions. If preliminary decisions indicate a specific course of action, additional analyses can be performed using the Economic Analysis Forecasting System (EIFS) (or some other regional economic model), once the additional case-specific data has been developed (using a "tiered" process consistent with NEPA).

Complete documentation of the EIFS model, its development, and applicable theoretical underpinnings is available in numerous publications; and these are identified and synopsized in the section labeled EIFS and the Hierarchical Approach; which offers a brief presentation of the overall theoretical basis of the model and supporting tools. EIFS is a location quotient/ export base model, while the RTV technique was developed to measure the regional significance of projected economic change, using the yearly Bureau of Economic Analysis (BEA) time series data on employment, income, and population to evaluate historical trends in the ROI to measure the "resilience" of the local community. The combined use of EIFS and the RTV technique meets the two pronged approach for significance determinations, intensity and context (CEQ, 1992).

To affect these analyses, the inputs to the EIFS model must be estimated. The normal EIFS inputs include:

- Number of affected (moving) civilians and their salaries
- Number of affected (moving) military employees and their salaries
- Percentage of affected military employees living on-post
- Changes in local procurement, contracting, and purchases
- Definition of the multi-county region of influence (ROI)

These data have often proven difficult to obtain (particularly if the decision making is at an early stage), as the actual numbers depend upon numerous unknown factors. To simplify, this programmatic analysis will focus only on military strength, as associated civilian strengths would not be large, and these stationing analyses focus entirely on tactical military units.

The following tables illustrate the calculation of average salary for Infantry Brigade Combat Team (IBCT) units, using mid-point (within grade) salary and housing allowance averages. It

should be noted that although none of the stationing scenarios include an IBCT (or any BCT), the ratio of Officer to Enlisted Soldiers is generally represented in an IBCT, and that ratio can be used to estimate the salaries of Soldiers within the "types" of units identified for consideration in this document:

IBCT Average Salary Calculation

Grade	No.	Mo. Salary	Total Salary	% On-post	Average BAH	Housing Expend	Salary + Housing
O6	1	6414	6414	0.5	2600	1300	7714
O5	9	6110	54990	0.5	2039	9175.5	64165.5
O4	32	5882	188224	0.5	1856	29696	217920
O3	102	5228	533256	0.5	1628	83028	616284
O2	131	3936	515616	0.5	1387	90848.5	606464.5
E9	12	4203	50436	0.5	1628	9768	60204
E8	46	3606	165876	0.5	1519	34937	200813
E7	158	3250	513500	0.5	1429	112891	626391
E6	341	2928	998448	0.5	1388	236654	1235102
E5	618	2582	1595676	0.5	1239	382851	1978527
E4	1114	2062	2297068	0.5	1151	641107	2938175
E3	854	1729	1476566	0.5	1148	490196	1966762
W4	2	4574	9148	0.5	1636	1636	10784
W3	4	4123	16492	0.5	1587	3174	19666
W2	24	3755	90120	0.5	1497	17964	108084
Totals	3448						10657056
Average Monthly Salary + BAH							3090.793503
Average Yearly Salary +BAH for IBCT							37089

BAH is the Basic Housing Allowance afforded to personnel living off post. The higher "accompanied" value was used.

Source: <http://www.usmilitary.about.com/housingallowance>

Monthly salary was obtained from attachments in an Email from Michael Ackerman (AEC), 3 January 07. Mid-point values (within each grade) were used.

As indicated in the tables, 50 percent of the personnel were estimated as on-post, and housing allowances are taken from those afforded to "accompanied" personnel. The mid-range salary estimates reflect approximately 14 years of military service. If additional information is obtained to refine such estimates, additional analyses can be done.

For all practical purposes, the value of \$37,100 per year can be effectively used for those notional units. This same value will be used for the scenarios in this analysis. If these assumptions are proven wrong in the future, a supplemental NEPA analysis could be performed consistent with 32 CFR Part 651.

Once input data, describing the nature of the proposed "notional actions", has been determined, the EIFS multi-county (or multi-borough in Alaska) region of influence (ROI) must be defined.

For the scenario in Hawai'i, Hawai'i and Honolulu counties were used; and for Alaska, Anchorage and Fairbanks North Star boroughs were used.

The estimated inputs were used to produce EIFS reports (model results) for changes in total business volume, employment, income, and population. These are best shown as percentages (of the activity in the total ROI), and can be compared to the RTVs for that variable.

Results and Summary Conclusions

The following results summarize the EIFS analyses for the scenarios, oriented according to three levels of Soldier strength (1000 and 3000 Soldier units):

The results present the anticipated total percentage change in business volume, income, employment, and population for the alternative "notional" units; as well as the respective RTVs for those local economic variables. The indicated appendices document the results of the EIFS analyses for 1000 Soldiers, while the values for 3000 are estimated using simple proportions (since, in this case, the comparative results will be linear and proportional).

Alaska (detailed in the section for the 1000 Soldier Unit in Alaska)

<u>Soldier Strength</u>	<u>1000</u>	<u>3000</u>	<u>RTV</u>
Business volume	0.18	0.54	24.42
Income	0.41	1.23	24.42
Employment	0.53	1.59	13.63
Population	0.74	2.22	5.86

Hawai'i (detailed in the section for the 1000 Soldier Unit in Hawai'i)

<u>Soldier Strength</u>	<u>1000</u>	<u>3000</u>	<u>RTV</u>
Business volume	0.08	0.24	5.43
Income	0.15	0.45	5.47
Employment	0.19	0.57	3.72
Population	0.24	0.72	2.34

The EIFS analyses indicate that the proposed actions (all scenarios will not produce major socioeconomic effects in the affected ROIs (communities). This significance determination is "conservative"--well within any errors produced through assumed EIFS input values. While these inputs could be refined, the results of the analysis (final determination) will certainly remain unchanged.

Unit moves can have potentially significant impacts on the local communities. Given the historical identification of schools as a major local concern, and the long timeframes required to develop school infrastructures, the following table can be used to facilitate further coordination and mitigation at the local level. The values in this table were derived from Army statistics, by grade, on the marital status of Army Soldiers, the number of children that Soldiers have, and other Army wide statistics (Email from Jeff Springer (AEC), 23 April 2007). The grade distribution for an Infantry Brigade was used to develop a distribution of children for the affected Soldiers (approximately 3000 Soldiers). Assuming the same distribution for smaller or similar-sized units (1000 and 3000 Soldiers), the original distribution was proportionately altered to produce the distributions shown.

1

	1000 Soldiers	3000 Soldiers
Total Children	401	1203
1 yr old	72	216
2 yr old	33	99
3 yr old	32	96
4 yr old	30	90
5 yr old	28	84
6 yr old	26	78
7 yr old	24	72
8 yr old	22	66
9 yr old	19	57
10 yr old	17	51
11 yr old	16	48
12 yr old	15	145
13 yr old	13	39
14 yr old	12	36
15 yr old	10	30
16 yr old	9	27
17 yr old	8	24
18 yr old	6	18
19+ yr old	9	27

2

3 Depending on the actual decisions associated with this proposed action, such as the actual
4 location of the units, and once such decisions are made, these estimates can be used for
5 coordination with local communities and school representatives. While these tables represent
6 the general, nation-wide distribution of school-age dependents associated with a given military
7 grade distribution within the units (Email from Jeff Springer (AEC), 23 April 2007), and will not
8 provide perfect estimates, they can be used for planning purposes in coordination with
9 potentially affected school systems. .

10

11 Housing impacts must similarly await more detailed information on unit location. Two recent
12 housing studies are available for the Alaskan scenarios (*2005 Housing Market Analysis—Fort*
13 *Wainwright, Alaska*, HQDA, ACSIM, prepared by Robert Niehaus, Inc., and *Housing*
14 *Requirements and Marketing Analysis for Fort Richardson and Elmendorf AFB, Alaska, 2007-*
15 *2012*, USAF, Dec, 2007). Before these can be incorporated, comparisons of the covered unit
16 moves (those use to project availability and shortfalls) must be compared to these anticipated
17 scenarios. After these relationships have been established, and the new net increased strengths
18 at the two Alaskan sites (Fort Wainwright and Fort Richardson) are determined, housing
19 impacts can be estimated.

20

21

The Economic Impact Forecast System (EIFS) and the Hierarchical Approach.

The Model:

The Economic Impact Forecast System (EIFS) (Huppertz, Claire E.; Bloomquist, Kim M.; Barbehenn, Jacinda M.; EIFS 5.0 Economic Impact Forecast System, User's Reference Manual; USACERL Technical Report TA-94/03; July 1994.) has been a mainstay of Army NEPA practice since its initial development and implementation in the mid-70s. EIFS provides a mechanism to estimate impacts, and ascertain the "significance" of projected impacts, using the Rational Threshold Value (RTV) technique. This analysis and determination can be readily documented, and if significance thresholds are not exceeded, the analysis can be completed. EIFS was designed to address NEPA applications, providing a "two-tier" approach to the process; (1) a simple and quick aggregate model (sufficient to ascertain the overall magnitude of impacts) and (2) a more detailed, sophisticated input-output (I-O) model to further analyze impacts that appear significant, in NEPA terms, and worthy of additional expenditures and analyses. This "two-tier" approach is consistent with the two common levels of NEPA analysis, the Environmental Assessment (EA) and the Environmental Impact Statement (EIS). EIFS has facilitated efficient and effective completion of such analyses for approximately 3 decades.

Complete documentation of the model, its development, and applicable theoretical underpinnings is available in numerous publications:

Huppertz, Claire E.; Bloomquist, Kim M.; Barbehenn, Jacinda M.; EIFS 5.0 Economic Impact Forecast System, User's Reference Manual; USACERL Technical Report TA-94/03; July 1994.

Isard, W., Methods of Regional Analysis, MIT Press, 1960.

Isard, W. and Langford, T., Regional Input-Output Study: Recollections, Reflections, and Diverse Notes on the Philadelphia Experience, MIT Press, 1971.

Isserman, A., "The Location Quotient Approach to Estimating Regional Economic Impacts", AIP Journal, January, 1977, pp. 33-41.

Isserman, A., "Estimating Export Activity in a Regional Economy: A Theoretical and Empirical Analysis of Alternative Methods", International Regional Science Review, Vol. 5, 1980, pp. 155-184.

Leigh, R., "The Use of Location Quotients in Urban Economic Base Studies", Land Economics, Vol 46, May, 1970, pp 202-205.

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Mayer, W. and Pleeter, S., "A Theoretical Justification for the Use of Location Quotients", Regional Science and Urban Economics, Vol 5, 1975, pp 343-355.

Robinson, D.P., Hamilton, J.W., Webster, R.D., and Olson, M.J., Economic Impact Forecast System (EIFS) II: User's Manual, Updated Edition, Technical Report N-69/ADA144950, U.S. Army Construction Engineering Research Lab (USACERL), 1984.

1 Robinson, D.P. and Webster, R.D., Enhancements to the Economic Impact Forecast
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4 Rogers, Claudia and Webster, Ron, "Qualitative Answers to Quantitative Questions",
5 Impact Assessment, IAIA, Vol.12, No.1, 1999.

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7 Thompson, W., A Preface to Urban Economics, Johns Hopkins Press, 1965.

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9 Tiebout, C., The Community Economic Base, New York Committee for Economic
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12 USACERL, "Methods for Evaluating the Significance of Impacts: The RTV and FSI
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15 U.S. Army, Department of the Army, DA Pamphlet 200-2, "Economic Impact Forecast
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18 U.S. Army, "Base Realignment and Closure "How-To" Manual for Compliance with the
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22 U.S. Army, Army Regulation 5-20, "Commercial Activities"

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24 U.S. Army, Department of the Army, DA Pamphlet 200-2, "Economic Impact Forecast
25 System-User Instructions", 1980

26
27 Webster, R.D.and Shannon, E.; The Rational Threshold Value (RTV) Technique for the
28 Evaluation of Regional Economic Impacts; USACERL Technical Report TR N-
29 49/ADA055561; 1978.

30
31 Webster, R.D., Hamilton, J.W., and Robinson, D.P., "The Two-Tier Concept for
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33 127/ADA118855.

34
35 These efforts reflect development of a tool for specific NEPA application, following the
36 successful NEPA litigation referenced in the Introduction. As EIFS has been used for Army
37 NEPA analyses, the results of EIFS analyses have been reviewed by stakeholder (affected
38 community) representatives, and, as a result of BRAC application, twice reviewed by the
39 Government Accounting Office (GAO). During such reviews, the analyses and resultant
40 decisions were upheld, and EIFS was lauded as a uniform (non-arbitrary and non-capricious)
41 approach to such requirements. Drawing from a national, uniform database, and using a
42 common, systematic approach, EIFS allowing the improved comparison of project alternatives
43 (the heart of NEPA analysis), and provides comparable analyses across the U.S.

44 NEPA Process Improvement:

45
46 Since NEPA was implemented, it has been commonly criticized as expensive and time-
47 consuming. While these criticisms have been often justified, the President's Council on
48 Environmental Quality (CEQ) has actively promoted NEPA process improvements; first in the
49 publication of the CEQ NEPA regulations (CEQ, Regulations for Implementing the Procedural
50 Provisions of the National Environmental Policy Act, Reprint, 40 CFR Parts 1500-1508,
51

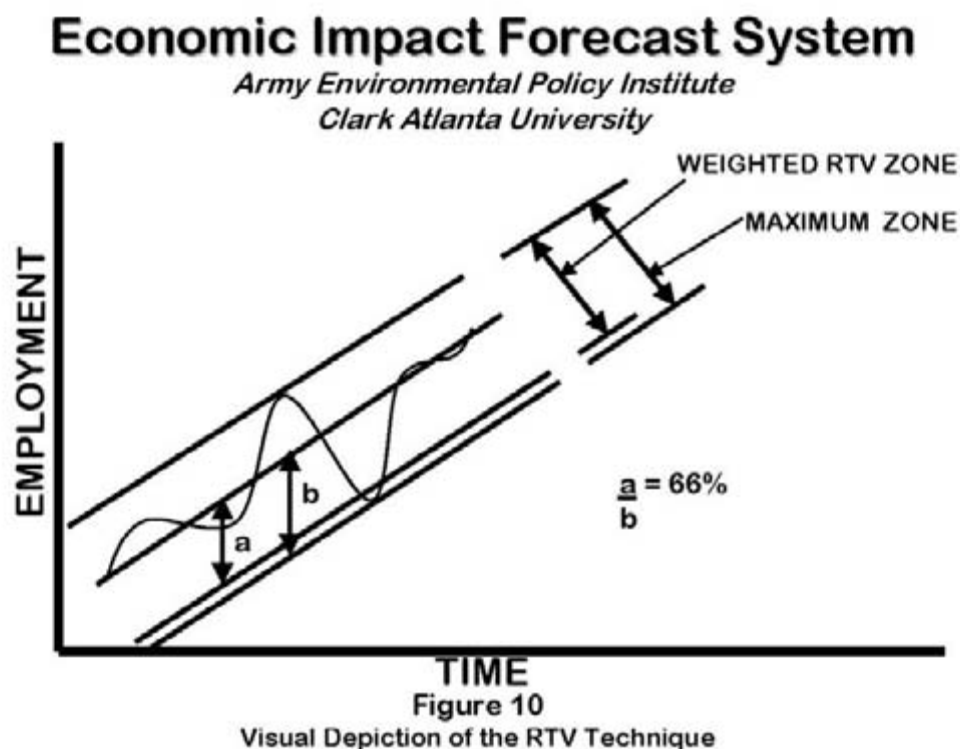
Executive Office of the President, Council on Environmental Quality, 1992.), and, more recently, through a NEPA anniversary introspective (CEQ, The National Environmental Policy Act: A Study of its Effectiveness After Twenty-five Years, Executive Office of the President, Council on Environmental Quality, January, 1997.) and the formal CEQ NEPA Task Force (CEQ, The NEPA Task Force Report to the Council on Environmental Quality: Modernizing NEPA Implementation, September, 2003.). All three CEQ initiatives call for more "focus" on NEPA documents, eliminating the analyses of minor or unimportant issues, and focusing, instead, on those issues that should be part of an informed agency decision. The use of EIFS, and the "two-tier" approach is consistent with these CEQ recommendations.

Determining Significance:

While EIFS was being developed, communities began to question the rationale for determining the significance of socioeconomic impacts. USACERL was directed to develop a defensible procedure for such a determination, resulting in the Rational Threshold Value (RTV) technique (Webster, R.D.; and Shannon, E.; The Rational Threshold Value (RTV) Technique for the Evaluation of Regional Economic Impacts; USACERL Technical Report TR N-49/ADA055561; 1978). This technique relies on the yearly Bureau of Economic Analysis (BEA) time series data on employment, income, and population to evaluate historical trends within a subject community (region); and uses those trends to measure the "resilience" of the local community to change, or its ability to accommodate such change. This approach has worked well when communicating with affected communities. The combined use of RTV with the EIFS model meet the two pronged approach for significance determinations, intensity and context (CEQ, 1992)

The initial EIFS implementation (USACERL, 1975) included the analysis of numerous variables: business volume, personal income, employment, government revenues and expenditures, income and employment distribution, local housing impacts, regional economic stability, school system impacts, government bond obligations, population, welfare and dependency, social control, and aesthetic considerations. The selection of these variables was based on the predictive capability of forecasting techniques and data availability. Over some 30 years of practice, pragmatism and sufficiency led to the use of sales volume, employment, personal income, and population as indicators of impacts (as a "first tier" approximation of effects). These effects can also be readily evaluated (and significance determined) using the BEA time series data. Population, important in its own right, is also a valuable indicator of other factors (e.g., impact on local government revenues and expenditures, housing, local school systems, and the change in welfare and dependency), as impacts on such variables are driven, to a large extent, by a population change.

Using BEA time series data is used to analyze the four variables for the ROI, the RTV model produces thresholds for assessing the magnitude of impacts. The RTV technique is simple, starting with a straight line between the first year of record and the last year of record for that variable, establishing the average rate of change over time. Then, each yearly deviation from that growth rate is calculated and converted to a percentage. The largest historical changes (both increase and decrease) are used to define significance thresholds. The following figure illustrates the RTV concept:



1

2 A "factor of safety" is applied to negative thresholds, as shown in the figure, to produce a
 3 conservative analysis; while 100% of the maximum positive thresholds is used; as indicated
 4 below:

	<u>Increase</u>	<u>Decrease</u>
6 Total sales volume	100 percent	75 percent
7 Total employment	100 percent	66 percent
8 Personal Income	100 percent	66 percent
9 Total population	100 percent	50 percent

10 The maximum positive historical fluctuation is used because of the positive connotations
 11 generally associated with economic growth. While economic growth can produce unacceptable
 12 impacts and the "smart growth" concept is increasingly favored, the effects of reductions and
 13 closures are usually much more controversial. These adjustments, while arbitrary, are sensible.
 14 The negative sales volume threshold is adjusted by 75%, as sales volume impacts can be
 15 absorbed by such factors as the manipulation of inventory, new equipment, etc; and the impacts
 16 on individual workers or proprietors is indirect, if at all. Changes in employment and income,
 17 however, are impacts that immediately affect individuals; thus they are adjusted by 66%.

1 Population is extremely important, as an indicator of other social issues, and is thus adjusted by
2 50%.

3
4 To adjust dollar amounts for inflation (to create "constant dollars" prior to calculations), the
5 Consumer Price Index (CPI) is used for appropriate years, and all dollar values are adjusted to
6 1987 equivalents.

7 The main strength of the RTV approach stems from its reliance on data for each individual ROI.
8 This approach addressed previous criticism of more simple approaches that applied arbitrary
9 criteria to all communities. This approach establishes unique criteria, representative of local
10 community patterns, and, while a community may not completely agree, a common frame of
11 reference is established. Critics of the RTV technique have questioned the arbitrary selection of
12 the maximum allowable deviations to indicate impact significance, but the process has proven
13 workable over the years.

EIFS Analysis for 1000 Soldier Unit in Alaska

EIFS REPORT

PROJECT NAME

1000-troops in Alaska

STUDY AREA

02020 Anchorage, AK

02090 Fairbanks North Star, AK

FORECAST INPUT

Change In Local Expenditures	\$0
Change In Civilian Employment	0
Average Income of Affected Civilian	\$0
Percent Expected to Relocate	0
Change In Military Employment	1000
Average Income of Affected Military	\$37,100
Percent of Military Living On-post	50

FORECAST OUTPUT

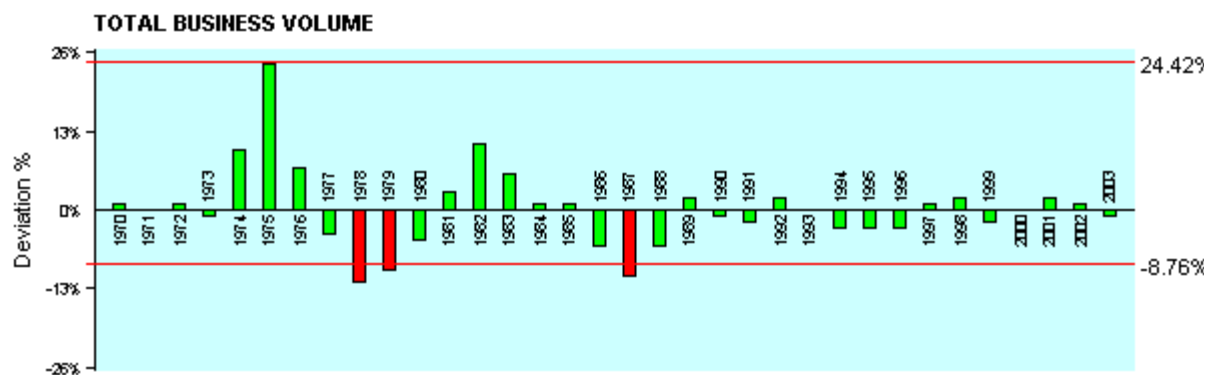
Multiplier	2.24
Sales Volume - Direct	\$11,825,630
Sales Volume - Induced	\$14,663,780
Sales Volume - Total	\$26,489,400 0.18%
Income - Direct	\$37,100,000
Income - Induced	\$3,032,571
Income - Total	\$40,132,570 0.41%
Employment - Direct	1075
Employment - Induced	93
Employment - Total	1168 0.53%
Local Population	2490
Local Off-base Population	1245 0.74%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	24.42 %	24.42 %	13.63 %	5.86 %
Negative RTV	-8.76 %	-7.82 %	-3.72 %	-1.9 %

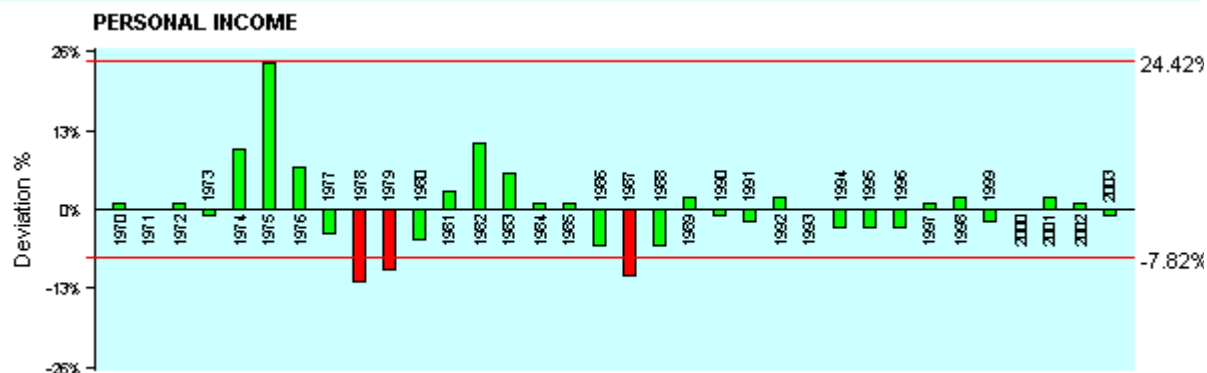
RTV DETAILED

SALES VOLUME



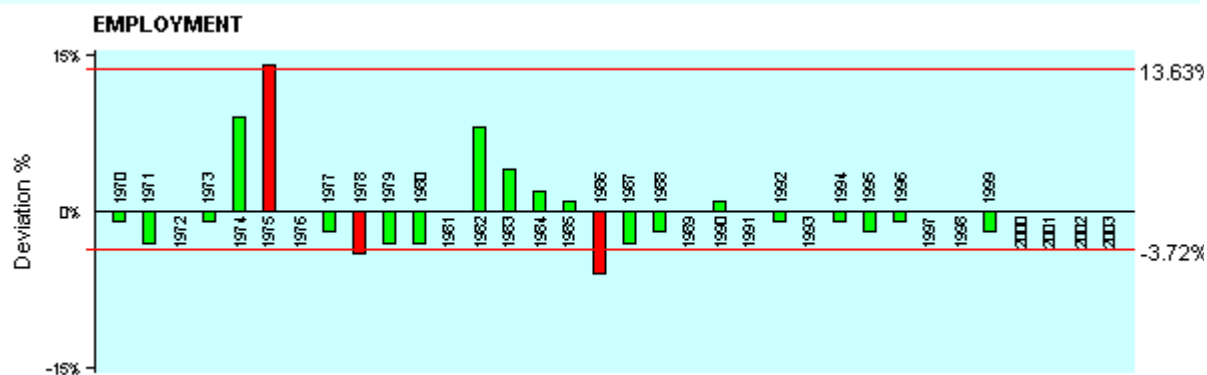
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	1823240	9590242	0	-495832	0
1970	2038476	10151610	561368	65536	0.65
1971	2221672	10597375	445765	-50067	-0.47
1972	2436646	11257305	659929	164097	1.46
1973	2672372	11624818	367514	-128318	-1.1
1974	3460862	13531970	1907152	1411320	10.43
1975	5170108	18560688	5028717	4532885	24.42
1976	6046512	20558141	1997453	1501621	7.3
1977	6356086	20275914	-282226	-778058	-3.84
1978	6283440	18598982	-1676932	-2172764	-11.68
1979	6518854	17340152	-1258831	-1754663	-10.12
1980	7285688	17048510	-291642	-787474	-4.62
1981	8483594	18070055	1021545	525713	2.91
1982	10405130	20810260	2740205	2244373	10.78
1983	11711494	22720298	1910038	1414206	6.22
1984	12642836	23515675	795377	299545	1.27
1985	13500436	24300785	785110	289278	1.19
1986	13340902	23479988	-820797	-1316629	-5.61
1987	12747822	21671297	-1808690	-2304522	-10.63
1988	12843088	20934233	-737064	-1232896	-5.89
1989	14050686	21919070	984837	489005	2.23
1990	14840722	22112676	193606	-302226	-1.37
1991	15560038	22095254	-17422	-513254	-2.32
1992	16642244	22966297	871043	375211	1.63
1993	17424904	23349371	383075	-112757	-0.48
1994	17869610	23230493	-118878	-614710	-2.65
1995	18068306	22946749	-283744	-779576	-3.4
1996	18425446	22663299	-283450	-779282	-3.44
1997	19418932	23302718	639420	143588	0.62
1998	20367094	24236842	934123	438291	1.81

1999	20972752	24328392	91550	-404282	-1.66
2000	22162306	24821783	493390	-2442	-0.01
2001	23810312	25953240	1131457	635625	2.45
2002	24881468	26623171	669931	174099	0.65
2003	25661306	26944371	321201	-174631	-0.65

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	911662	4795342	0	-247932	0
1970	1019438	5076801	281459	33527	0.66
1971	1111034	5299632	222831	-25101	-0.47
1972	1218650	5630163	330531	82599	1.47
1973	1336506	5813801	183638	-64294	-1.11
1974	1730980	6768132	954331	706399	10.44
1975	2585942	9283532	2515400	2267468	24.42
1976	3024174	10282192	998660	750728	7.3
1977	3178725	10140133	-142059	-389991	-3.85
1978	3142585	9302052	-838081	-1086013	-11.67
1979	3259829	8671145	-630906	-878838	-10.14
1980	3643081	8524810	-146336	-394268	-4.62
1981	4241805	9035045	510235	262303	2.9
1982	5202555	10405110	1370065	1122133	10.78
1983	5855515	11359699	954589	706657	6.22
1984	6320513	11756154	396455	148523	1.26
1985	6748298	12146936	390782	142850	1.18
1986	6669462	11738253	-408683	-656615	-5.59
1987	6374405	10836488	-901765	-1149697	-10.61
1988	6422354	10468437	-368051	-615983	-5.88
1989	7024927	10958886	490449	242517	2.21
1990	7420887	11057122	98236	-149696	-1.35
1991	7781361	11049533	-7589	-255521	-2.31

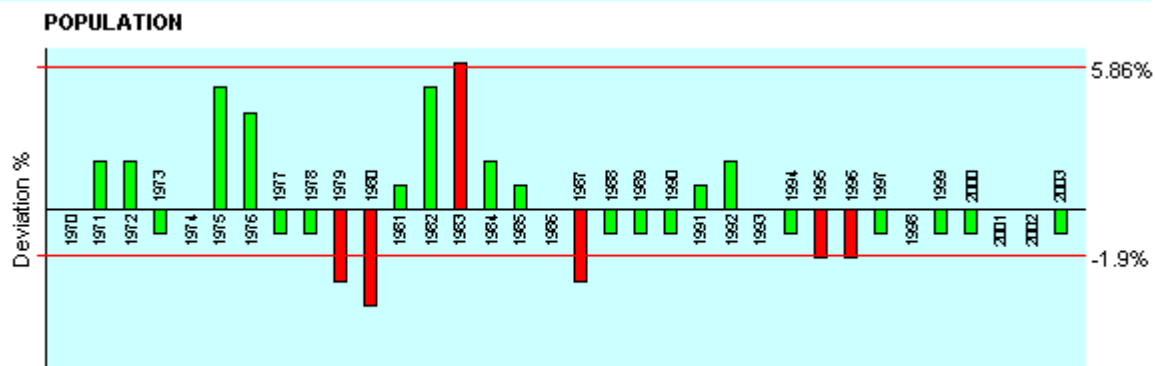
1992	8323478	11486400	436867	188935	1.64
1993	8713588	11676208	189808	-58124	-0.5
1994	8934306	11614598	-61610	-309542	-2.67
1995	9035133	11474619	-139979	-387911	-3.38
1996	9211892	11330627	-143992	-391924	-3.46
1997	9709039	11650847	320220	72288	0.62
1998	10183784	12118703	467856	219924	1.81
1999	10486246	12164045	45342	-202590	-1.67
2000	11081270	12411022	246977	-955	-0.01
2001	11906803	12978415	567393	319461	2.46
2002	12442177	13313129	334714	86782	0.65
2003	12831385	13472954	159825	-88107	-0.65

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	88228	0	-4454	0
1970	91593	3365	-1089	-1.19
1971	93611	2018	-2436	-2.6
1972	98289	4678	224	0.23
1973	102048	3759	-695	-0.68
1974	117557	15509	11055	9.4
1975	141260	23703	19249	13.63
1976	145610	4350	-104	-0.07
1977	146768	1158	-3296	-2.25
1978	145362	-1406	-5860	-4.03
1979	145944	582	-3872	-2.65
1980	146210	266	-4188	-2.86
1981	151288	5078	624	0.41
1982	169410	18122	13668	8.07
1983	181462	12052	7598	4.19
1984	190523	9061	4607	2.42

1985	196412	5889	1435	0.73
1986	190299	-6113	-10567	-5.55
1987	188870	-1429	-5883	-3.11
1988	188679	-191	-4645	-2.46
1989	192711	4032	-422	-0.22
1990	199536	6825	2371	1.19
1991	204882	5346	892	0.44
1992	206771	1889	-2565	-1.24
1993	211104	4333	-121	-0.06
1994	212767	1663	-2791	-1.31
1995	213239	472	-3982	-1.87
1996	214915	1676	-2778	-1.29
1997	219101	4186	-268	-0.12
1998	224485	5384	930	0.41
1999	225083	598	-3856	-1.71
2000	230696	5613	1159	0.5
2001	234846	4150	-304	-0.13
2002	239762	4916	462	0.19
2003	244135	4373	-81	-0.03

POPULATION



Year	Value	Change	Deviation	%Deviation
1969	168003	0	-5374	0
1970	173509	5506	132	0.08
1971	181879	8370	2996	1.65
1972	190893	9014	3640	1.91
1973	194968	4075	-1299	-0.67
1974	200866	5898	524	0.26
1975	216800	15934	10560	4.87
1976	230479	13679	8305	3.6
1977	232436	1957	-3417	-1.47

1978	234967	2531	-2843	-1.21
1979	233735	-1232	-6606	-2.83
1980	230328	-3407	-8781	-3.81
1981	237545	7217	1843	0.78
1982	255121	17576	12202	4.78
1983	276723	21602	16228	5.86
1984	288554	11831	6457	2.24
1985	298281	9727	4353	1.46
1986	303485	5204	-170	-0.06
1987	298698	-4787	-10161	-3.4
1988	299735	1037	-4337	-1.45
1989	302495	2760	-2614	-0.86
1990	305681	3186	-2188	-0.72
1991	315616	9935	4561	1.45
1992	328129	12513	7139	2.18
1993	333142	5013	-361	-0.11
1994	335790	2648	-2726	-0.81
1995	333922	-1868	-7242	-2.17
1996	333590	-332	-5706	-1.71
1997	335183	1593	-3781	-1.13
1998	340531	5348	-26	-0.01
1999	342738	2207	-3167	-0.92
2000	343228	490	-4884	-1.42
2001	347515	4287	-1087	-0.31
2002	352537	5022	-352	-0.1
2003	356088	3551	-1823	-0.51

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EIFS Analysis for 1000 Soldier Unit in Hawai'i

EIFS REPORT

PROJECT NAME

1000 troops in Hawai'i

STUDY AREA

15001 Hawai'i, HI
15003 Honolulu, HI

FORECAST INPUT

Change In Local Expenditures	\$0
Change In Civilian Employment	0
Average Income of Affected Civilian	\$0
Percent Expected to Relocate	0
Change In Military Employment	1000
Average Income of Affected Military	\$37,100
Percent of Military Living On-post	50

FORECAST OUTPUT

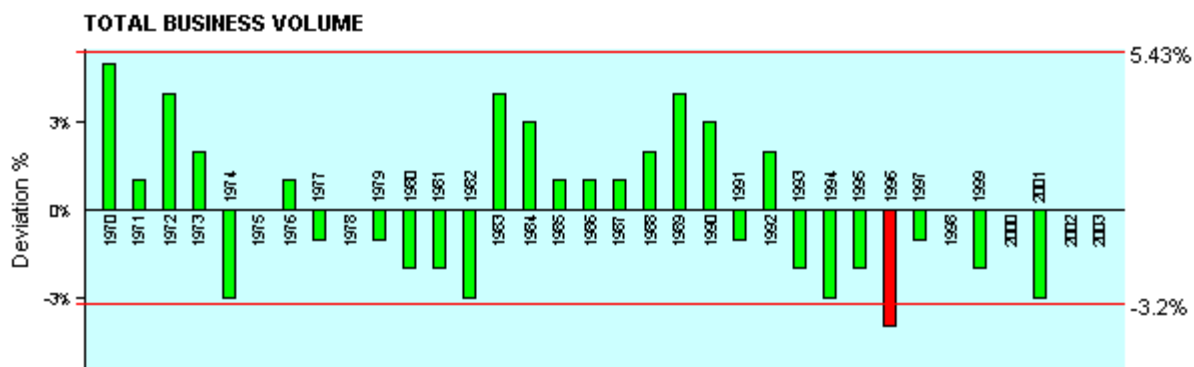
Multiplier	2.41
Sales Volume - Direct	\$11,825,630
Sales Volume - Induced	\$16,674,130
Sales Volume - Total	\$28,499,760 0.08%
Income - Direct	\$37,100,000
Income - Induced	\$3,274,586
Income - Total	\$40,374,580 0.15%
Employment - Direct	1081
Employment - Induced	115
Employment - Total	1196 0.19%
Local Population	2490
Local Off-base Population	1245 0.24%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	5.43 %	5.47 %	3.72 %	2.34 %
Negative RTV	-3.2 %	-2.84 %	-1.76 %	-0.87 %

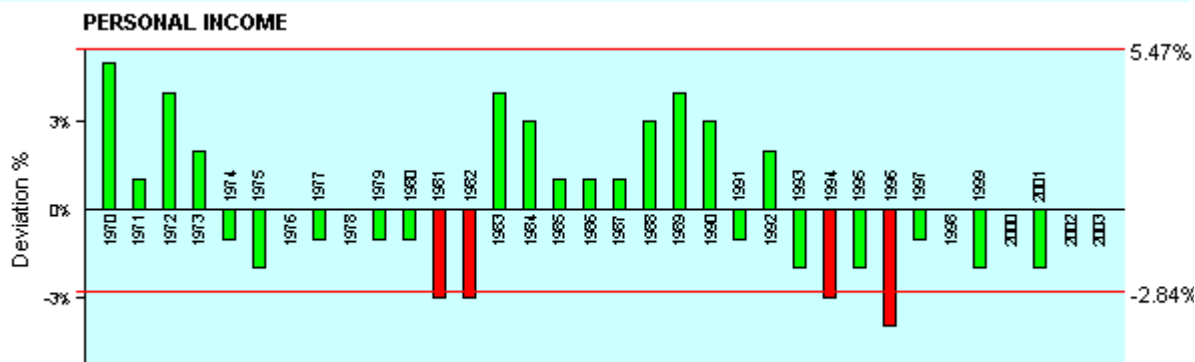
RTV DETAILED

SALES VOLUME



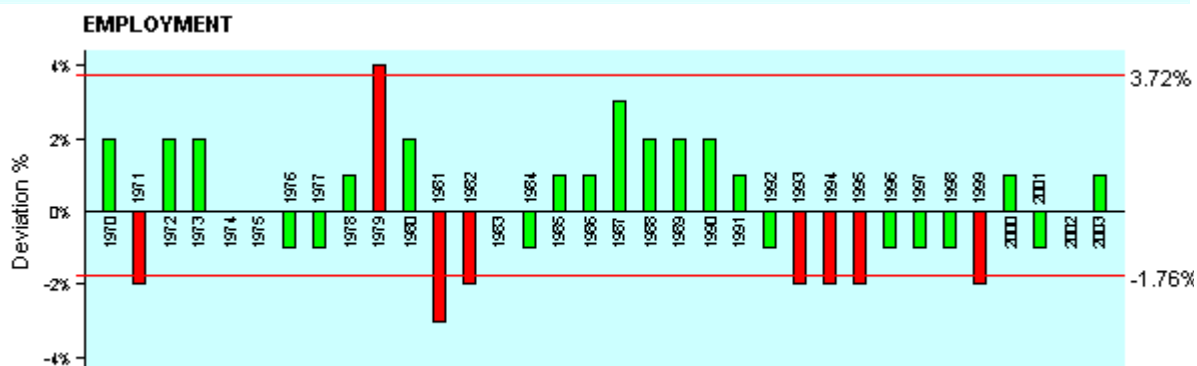
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	6052658	31836981	0	-1046221	0
1970	6982442	34772561	2935580	1889359	5.43
1971	7598966	36247068	1474507	428286	1.18
1972	8392926	38775318	2528250	1482029	3.82
1973	9334100	40603335	1828017	781796	1.93
1974	10361978	40515334	-88001	-1134222	-2.8
1975	11552996	41475256	959922	-86299	-0.21
1976	12596180	42827012	1351756	305535	0.71
1977	13650468	43544993	717981	-328240	-0.75
1978	15128872	44781461	1236468	190247	0.42
1979	17123680	45548989	767528	-278693	-0.61
1980	19454140	45522688	-26301	-1072522	-2.36
1981	21441246	45669854	147166	-899055	-1.97
1982	22605440	45210880	-458974	-1505195	-3.33
1983	24817000	48144980	2934100	1887879	3.92
1984	27294720	50768179	2623199	1576978	3.11
1985	28971258	52148264	1380085	333864	0.64
1986	30454008	53599054	1450790	404569	0.75
1987	32513304	55272617	1673563	627342	1.13
1988	35427774	57747272	2474655	1428434	2.47
1989	39324440	61346126	3598855	2552634	4.16
1990	43191788	64355764	3009638	1963417	3.05
1991	45545038	64673954	318190	-728031	-1.13
1992	48839632	67398692	2724738	1678517	2.49
1993	50246558	67330388	-68304	-1114525	-1.66
1994	51208576	66571149	-759239	-1805460	-2.71
1995	52023664	66070053	-501096	-1547317	-2.34
1996	52332932	64369506	-1700547	-2746768	-4.27
1997	53870760	64644912	275406	-770815	-1.19
1998	55016856	65470059	825147	-221074	-0.34

1999	56287652	65293676	-176382	-1222603	-1.87
2000	59365150	66488968	1195292	149071	0.22
2001	60432984	65871953	-617015	-1663236	-2.52
2002	62703456	67092698	1220745	174524	0.26
2003	65194958	68454706	1362008	315787	0.46

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	3093999	16274435	0	-516971	0
1970	3566967	17763496	1489061	972090	5.47
1971	3872618	18472388	708892	191921	1.04
1972	4269233	19723856	1251469	734498	3.72
1973	4744091	20636796	912939	395968	1.92
1974	5367473	20986819	350024	-166947	-0.8
1975	5895036	21163179	176360	-340611	-1.61
1976	6393338	21737349	574170	57199	0.26
1977	6928368	22101494	364145	-152826	-0.69
1978	7664845	22687941	586447	69476	0.31
1979	8676165	23078599	390658	-126313	-0.55
1980	9947942	23278184	199585	-317386	-1.36
1981	10840990	23091309	-186876	-703847	-3.05
1982	11441915	22883830	-207479	-724450	-3.17
1983	12601286	24446495	1562665	1045694	4.28
1984	13781380	25633367	1186872	669901	2.61
1985	14610766	26299379	666012	149041	0.57
1986	15377180	27063837	764458	247487	0.91
1987	16393703	27869295	805458	288487	1.04
1988	17877960	29141075	1271780	754809	2.59
1989	19819215	30917975	1776901	1259930	4.08
1990	21757187	32418209	1500233	983262	3.03
1991	22905669	32526050	107841	-409130	-1.26

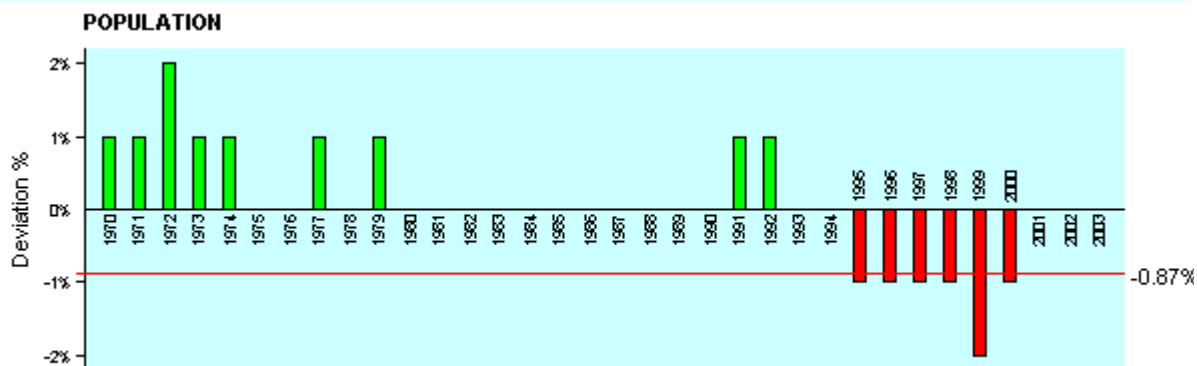
1992	24518721	33835835	1309785	792814	2.34
1993	25244924	33828198	-7637	-524608	-1.55
1994	25718539	33434101	-394097	-911068	-2.72
1995	26117490	33169212	-264888	-781859	-2.36
1996	26272491	32315164	-854048	-1371019	-4.24
1997	27057398	32468878	153714	-363257	-1.12
1998	27636023	32886867	417990	-98981	-0.3
1999	28289826	32816198	-70669	-587640	-1.79
2000	29800111	33376124	559926	42955	0.13
2001	30347228	33078479	-297646	-814617	-2.46
2002	31482557	33686336	607857	90886	0.27
2003	32731835	34368427	682091	165120	0.48

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	380761	0	-8013	0
1970	397730	16969	8956	2.25
1971	399720	1990	-6023	-1.51
1972	414793	15073	7060	1.7
1973	433296	18503	10490	2.42
1974	443251	9955	1942	0.44
1975	453274	10023	2010	0.44
1976	455652	2378	-5635	-1.24
1977	457509	1857	-6156	-1.35
1978	471052	13543	5530	1.17
1979	497574	26522	18509	3.72
1980	514017	16443	8430	1.64
1981	508703	-5314	-13327	-2.62
1982	505694	-3009	-11022	-2.18
1983	512725	7031	-982	-0.19
1984	517608	4883	-3130	-0.6

1985	529417	11809	3796	0.72
1986	540318	10901	2888	0.53
1987	566087	25769	17756	3.14
1988	585777	19690	11677	1.99
1989	607282	21505	13492	2.22
1990	630372	23090	15077	2.39
1991	645973	15601	7588	1.17
1992	645578	-395	-8408	-1.3
1993	642975	-2603	-10616	-1.65
1994	636715	-6260	-14273	-2.24
1995	631780	-4935	-12948	-2.05
1996	630497	-1283	-9296	-1.47
1997	629728	-769	-8782	-1.39
1998	628961	-767	-8780	-1.4
1999	625634	-3327	-11340	-1.81
2000	642289	16655	8642	1.35
2001	643139	850	-7163	-1.11
2002	648542	5403	-2610	-0.4
2003	661217	12675	4662	0.71

POPULATION



Year	Value	Change	Deviation	%Deviation
1969	666542	0	-11016	0
1970	687305	20763	9747	1.42
1971	706551	19246	8230	1.16
1972	734752	28201	17185	2.34
1973	756628	21876	10860	1.44
1974	771924	15296	4280	0.55
1975	785078	13154	2138	0.27
1976	797392	12314	1298	0.16
1977	817572	20180	9164	1.12

1978	826166	8594	-2422	-0.29
1979	842497	16331	5315	0.63
1980	856717	14220	3204	0.37
1981	863695	6978	-4038	-0.47
1982	874873	11178	162	0.02
1983	889861	14988	3972	0.45
1984	901319	11458	442	0.05
1985	910194	8875	-2141	-0.24
1986	918806	8612	-2404	-0.26
1987	930182	11376	360	0.04
1988	937511	7329	-3687	-0.39
1989	947922	10411	-605	-0.06
1990	960106	12184	1168	0.12
1991	977776	17670	6654	0.68
1992	995589	17813	6797	0.68
1993	1005433	9844	-1172	-0.12
1994	1016304	10871	-145	-0.01
1995	1021891	5587	-5429	-0.53
1996	1025378	3487	-7529	-0.73
1997	1031156	5778	-5238	-0.51
1998	1032742	1586	-9430	-0.91
1999	1025876	-6866	-17882	-1.74
2000	1024643	-1233	-12249	-1.2
2001	1031203	6560	-4456	-0.43
2002	1041088	9885	-1131	-0.11
2003	1052093	11005	-11	0

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APPENDIX B: THREATENED AND ENDANGERED SPECIES RELEVANT TO THE AFFECTED ENVIRONMENT

Installation	State	Scientific Name (Genus species)	Common Name	Onsite/ Contiguous	Federal Listing Status	Category	Critical Habitat Onsite
U.S. Army Garrison, Hawai'i							
Kahuku Training Area	HI	<i>Cyanea koolauensis</i>	Haha	Onsite	E	Plant	N
		<i>Eugenia koolauensis</i>	Nioi	Onsite	E	Plant	N
		<i>Gardenia mannii</i>	Nanu	Onsite	E	Plant	N
		<i>Tetraplasandra gymnocarpa</i>	Ohe`ohe	Onsite	E	Plant	N
Kawailoa Training Area	HI	<i>Achatinella apexfulva</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella bulimoides</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella byronii</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella lila</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella livida</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella sowerbyana</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Chamaesyce rockii</i>	`Akoko	Onsite	E	Plant	N
		<i>Cyanea acuminata</i>	Haha	Onsite	E	Plant	N
		<i>Cyanea crispa</i>	No common name	Onsite	E	Plant	N
		<i>Cyanea humboldtiana</i>	Haha	Onsite	E	Plant	N
		<i>Cyanea koolauensis</i>	Haha	Onsite	E	Plant	N
		<i>Cyanea st-johnii</i>	Haha	Onsite	E	Plant	N
		<i>Cyrtandra dentata</i>	Ha`iwale	Onsite	E	Plant	N
		<i>Cyrtandra viridiflora</i>	Ha`iwale	Onsite	E	Plant	N
		<i>Gardenia mannii</i>	Nanu	Onsite	E	Plant	N
		<i>Hesperomannia arborescens</i>	No common name	Onsite	E	Plant	N
		<i>Lycopodium nutans</i>	No common name	Onsite	E	Plant	N
		<i>Melicope lydgatei</i>	Alani	Onsite	E	Plant	N
		<i>Myrsine juddii</i>	Kolea	Onsite	E	Plant	N
		<i>Phyllostegia hirsuta</i>	No common name	Onsite	E	Plant	N
		<i>Pteris lidgatei</i>	No common name	Onsite	E	Plant	N
		<i>Sanicula purpurea</i>	No common name	Onsite	E	Plant	N
		<i>Tetraplasandra gymnocarpa</i>	Ohe`ohe	Onsite	E	Plant	N
		<i>Viola oahuensis</i>	No common name	Onsite	E	Plant	N
Pohakuloa Training Area	HI	<i>Asplenium fragile</i> <i>var. insulare</i>	No common name	Onsite	E	Plant	N
		<i>Haplostachys haplostachya</i>	Honohono	Onsite	E	Plant	N
		<i>Hedyotis coriacea</i>	Kio`ele	Onsite	E	Plant	N

Installation	State	Scientific Name (Genus species)	Common Name	Onsite/ Contiguous	Federal Listing Status	Category	Critical Habitat Onsite
		<i>Lasiurus cinereus semotus</i>	Bat, Hawaiian hoary	Onsite	E	Mammal	N
		<i>Loxioides bailleui</i>	Palila	Contiguous	E	Bird	Y
		<i>Neraudia ovata</i>	No common name	Onsite	E	Plant	N
		<i>Portulaca sclerocarpa</i>	Po`e	Onsite	E	Plant	N
		<i>Silene hawaiiensis</i>	No common name	Onsite	T	Plant	N
		<i>Silene lanceolata</i>	No common name	Onsite	E	Plant	N
		<i>Solanum incompletum</i>	Popolo ku mai	Onsite	E	Plant	N
		<i>Spermolepis hawaiiensis</i>	No common name	Onsite	E	Plant	N
		<i>Stenogyne angustifolia</i> var. <i>angustifolia</i>	No common name	Onsite	E	Plant	N
		<i>Tetramolopium arenarium</i>	No common name	Onsite	E	Plant	N
		<i>Zanthoxylum hawaiiense</i>	A`e	Onsite	E	Plant	N
Schofield Barracks	HI	<i>Abutilon sandwicense</i>	No common name	Onsite	E	Plant	N
		<i>Achatinella byronii</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella mustelina</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Achatinella sowerbyana</i>	Pupu kuahiwi	Onsite	E	Snail	N
		<i>Alectryon macrococcus</i>	Mahoe	Onsite	E	Plant	N
		<i>Alsinidendron trinerve</i>	No common name	Onsite	E	Plant	N
		<i>Chamaesyce rockii</i>	`Akoko	Onsite	E	Plant	N
		<i>Chasiempis sandwichensis ibidis</i>	Elepaio, Oahu	Onsite	E	Bird	Y
		<i>Cyanea acuminata</i>	Haha	Onsite	E	Plant	N
		<i>Cyanea grimesiana</i> ssp. <i>obatae</i>	Haha	Onsite	E	Plant	N
		<i>Cyanea koolauensis</i>	Haha	Onsite	E	Plant	N
		<i>Cyrtandra subumbellata</i>	Ha`iwale	Onsite	E	Plant	N
		<i>Cyrtandra viridiflora</i>	Ha`iwale	Onsite	E	Plant	N
		<i>Delissea subcordata</i>	Haha	Onsite	E	Plant	N
		<i>Diellia falcata</i>	No common name	Onsite	E	Plant	N
		<i>Flueggea neowawraea</i>	Mehameham e	Onsite	E	Plant	N
		<i>Gardenia mannii</i>	Nanu	Onsite	E	Plant	N
		<i>Hesperomannia arborescens</i>	No common name	Onsite	E	Plant	N
		<i>Isodendron longifolium</i>	Aupaka	Onsite	T	Plant	N
		<i>Joinvillea ascendens ascendens</i>	Ohe	Onsite	C	Plant	N
Schofield Barracks (cont'd)		<i>Labordia cyrtandrae</i>	Kamakahala	Onsite	E	Plant	N

Installation	State	Scientific Name (Genus species)	Common Name	Onsite/ Contiguous	Federal Listing Status	Category	Critical Habitat Onsite
		<i>Lepidium arbuscula</i>	Anaunau	Onsite	E	Plant	N
		<i>Lobelia gaudichaudii</i> ssp. <i>koolauensis</i>	No common name	Onsite	E	Plant	N
		<i>Lycopodium nutans</i>	No common name	Onsite	E	Plant	N
		<i>Phyllostegia hirsuta</i>	No common name	Onsite	E	Plant	N
		<i>Phyllostegia kaalaensis</i>	No common name	Onsite	E	Plant	N
		<i>Phyllostegia mollis</i>	No common name	Onsite	E	Plant	N
		<i>Plantago princeps</i>	Kuahiwi laukahi	Onsite	E	Plant	N
		<i>Pteris lidgatei</i>	No common name	Onsite	E	Plant	N
		<i>Sanicula purpurea</i>	No common name	Onsite	E	Plant	N
		<i>Schiedea hookeri</i>	No common name	Onsite	E	Plant	N
		<i>Schiedea kaalae</i>	No common name	Onsite	E	Plant	N
		<i>Stenogyne kanehoana</i>	No common name	Onsite	E	Plant	N
		<i>Urera kaalae</i>	Opuhe	Onsite	E	Plant	N
		<i>Viola chamissoniana</i> ssp. <i>chamissoniana</i>	Pamakani	Onsite	E	Plant	N
		<i>Viola oahuensis</i>	No common name	Onsite	E	Plant	N
Tripler Army Medical Center	HI	<i>Megalagrion xanthomelas</i>	Damselfly, orangeblack Hawaiian	Onsite	C	Insect	N
U.S. Army Garrison, Alaska*							
NA	NA	NA	NA	NA	NA	NA	NA
* Cook Inlet, AK – The Beluga Whale (<i>Delphinapterus leucas</i>) is a Proposed Species and has not yet been placed on the Endangered Species list. The whale species was proposed to be listed in April 2007, a final decision is pending.							

APPENDIX C: SCHOOL ENROLLMENT FOR THE STATE OF HAWAII

Official Enrollment Count 2007-08

	No. of Schs.	Regular Education												Special Education				GRAND TOTAL	Pre-K Specd Reg			
		K	1	2	3	4	5	6	7	8	9	10	11	12	RTOT	K-6	7-8			9-12	Total	
HONOLULU	54	2243	2243	2401	2248	2220	2199	2102	2103	2203	2678	2021	2024	1664	28550	1173	472	1079	2724	284	13	
CENTRAL	42	2614	2387	2423	2288	2242	2196	2065	2108	2117	2879	2093	1973	1699	28585	1865	531	1134	3390	306	39	
LEeward	42	2972	2786	2844	2773	2744	2620	2769	2711	2650	3173	2703	2456	2157	35458	1827	686	1566	4079	36537	269	38
WINDWARD	30	1301	1147	1185	1103	1079	1065	1081	927	995	1181	965	970	800	13848	864	294	803	1961	19800	160	60
HAWAII	42	1801	1735	1697	1620	1566	1561	1516	1387	1380	1837	1705	1718	1474	21077	1239	477	1302	3018	24065	151	43
MAUI	31	1653	1365	1500	1446	1381	1410	1315	1266	1274	1581	1318	1370	1159	19059	824	360	826	2209	20267	105	29
KAUAI	16	702	653	607	620	651	623	659	610	682	700	621	746	562	8506	317	137	371	625	8091	45	9
SPEC. SCH.	3	0	0	0	0	0	0	0	0	0	0	1	0	0	1	37	21	28	86	87	10	0
CHARTER SCH.	27	533	438	478	460	454	389	506	584	534	331	371	273	224	5575	185	120	129	428	6003	0	0
TOTAL	287	14070	12744	13235	12529	12367	12063	12013	11796	11835	13650	11768	11530	9819	195719	8221	3098	7331	18650	178269	1300	231

DEC-0708 BY SCH

OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR																						
Schools	SCH	K	1	2	3	4	5	6	7	8	9	10	11	12	RTOT	K-6	7-8	9-12	SPEED	G-TOT PRK'S PRMR		
HONOLULU DISTRICT																						
100 ANA'AHINA		86	85	92	69	70	47	0	0	0	0	0	0	0	449	35	0	0	35	484	5	0
101 ALA WAI		74	62	76	69	65	65	0	0	0	0	0	0	0	411	30	0	0	30	448	9	1
102 ALUANI		40	34	41	42	36	40	0	0	0	0	0	0	0	251	28	0	0	28	279	6	0
103 ANI'ENUE		37	29	19	20	26	13	20	36	38	29	24	23	24	337	10	6	18	34	371	0	0
104 CENTRAL MID		0	0	0	0	0	0	137	125	143	0	0	0	0	405	10	42	0	52	457	0	0
105 DOLE MID		0	0	0	0	0	0	230	248	208	0	0	0	0	771	20	63	0	83	864	0	0
106 FAIRINGTON HI		0	0	0	0	0	0	0	0	0	742	562	490	460	2357	0	0	273	273	2500	0	0
107 FERN		52	67	69	52	53	50	0	0	0	0	0	0	0	443	45	0	0	45	483	4	1
108 HAHIONE		68	53	58	70	67	65	0	0	0	0	0	0	0	381	24	0	0	24	405	3	0
109 HOKULANI		63	63	60	60	51	57	0	0	0	0	0	0	0	354	10	0	0	10	364	4	0
110 JARRETT MID		0	0	0	0	0	0	80	87	76	0	0	0	0	243	14	28	0	42	285	0	0
111 JEFFERSON		51	56	42	45	48	50	47	0	0	0	0	0	0	347	26	0	0	26	373	7	0
112 KAHUMANU		75	58	108	70	95	93	0	0	0	0	0	0	0	529	37	0	0	37	566	14	0
113 KIWANI		48	44	42	37	30	51	0	0	0	0	0	0	0	252	22	0	0	22	274	9	0
114 KUALA		85	81	76	76	71	56	47	0	0	0	0	0	0	482	32	0	0	32	514	5	0
115 KUMUKU HI		0	0	0	0	0	0	0	0	0	339	288	195	171	993	0	0	210	210	1203	0	0
116 KUMUKU MID		0	0	0	0	0	0	143	269	265	0	0	0	0	677	17	0	0	17	751	0	0
118 KAUEA HI		0	0	0	0	0	0	0	0	0	229	198	254	194	873	0	0	108	108	979	0	0
117 KULANI		64	65	60	72	70	65	0	0	0	0	0	0	0	376	20	0	0	20	396	5	0
119 KALAKALA MID		0	0	0	0	0	0	282	320	314	0	0	0	0	844	32	63	0	95	1038	0	0
119 KALANI HI		0	0	0	0	0	0	0	0	0	289	232	279	219	1029	0	0	56	56	1125	0	0
120 KULHI		43	42	51	39	35	29	0	0	0	0	0	0	0	239	16	0	0	16	245	7	0
121 KULIHUKAI		104	80	101	109	107	114	0	0	0	0	0	0	0	620	59	0	0	59	687	12	0
122 KULIUKA		39	36	42	35	39	40	0	0	0	0	0	0	0	231	18	0	0	18	249	5	0
123 KULIUPUNA		77	60	66	101	85	88	0	0	0	0	0	0	0	480	52	0	0	52	540	5	0
125 KAMUKO		64	64	57	49	57	45	0	0	0	0	0	0	0	336	31	0	0	31	367	7	0
124 KAPALAMA		107	105	115	102	106	82	0	0	0	0	0	0	0	617	13	0	0	13	630	7	0
125 KALLIMELA		61	44	65	52	53	63	0	0	0	0	0	0	0	345	19	0	0	19	364	10	4
126 KAWANUKA MID		0	0	0	0	0	0	200	257	279	0	0	0	0	736	15	52	0	67	803	0	0
127 KOKO HEAD		48	42	44	40	39	38	0	0	0	0	0	0	0	251	22	0	0	22	273	4	0
128 KUKO		52	39	53	54	43	40	0	0	0	0	0	0	0	246	20	0	0	20	266	6	1
129 KUKULA		48	40	43	40	45	47	0	0	0	0	0	0	0	281	22	0	0	22	303	8	1
130 KUKULU		58	60	53	44	48	35	0	0	0	0	0	0	0	303	21	0	0	21	324	7	0
131 KUKULU		61	58	52	61	58	67	0	0	0	0	0	0	0	357	25	0	0	25	382	12	0
132 KUKULANI		17	17	15	15	23	20	15	0	0	0	0	0	0	123	23	0	0	23	146	4	0
133 KUKULANI		69	60	60	0	0	0	0	0	0	0	0	0	0	305	9	0	0	9	314	6	0
134 KUKULU		58	46	66	63	56	64	0	0	0	0	0	0	0	363	26	0	0	26	389	8	1
135 KUKULU		72	74	85	80	82	82	0	0	0	0	0	0	0	485	28	0	0	28	513	4	0
136 KUKULU		59	119	100	113	99	95	55	0	0	0	0	0	0	713	31	0	0	31	744	6	0
137 KUKULU		88	76	86	79	79	69	69	0	0	0	0	0	0	545	38	0	0	38	583	2	1
138 KUKULU		0	0	0	0	0	0	0	0	0	625	375	412	248	1900	0	0	187	187	1857	0	0
139 KUKULU		0	0	0	0	0	0	0	0	0	0	0	0	0	716	20	56	0	76	792	0	0
139 KUKULU		76	69	79	76	76	63	0	0	0	0	0	0	0	438	21	0	0	21	459	5	0
141 KUKULU		86	57	42	53	57	60	0	0	0	0	0	0	0	335	8	0	0	8	343	0	0
142 KUKULU		46	24	36	40	36	38	0	0	0	0	0	0	0	220	20	0	0	20	240	4	0
143 KUKULU		51	53	51	50	46	51	0	0	0	0	0	0	0	302	26	0	0	26	328	2	0

OEC-0708 BY SCH

OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR																						
schoolcode	SCH	K	1	2	3	4	5	6	7	8	9	10	11	12	ETOT	K-12	7-8	9-12	SPEO	G TOT	PRSK'S	PRESOR
145	RUHALE	49	39	42	33	45	49	0	0	0	0	0	0	0	257	12	0	0	12	269	4	1
146	ROOSEVELT H	0	0	0	0	0	0	0	0	0	415	344	371	345	1475	0	0	179	179	1654	0	0
147	ROYAL	52	64	55	60	52	54	0	0	0	0	0	0	0	338	35	0	0	35	373	13	0
148	STEVENSON MID	0	0	0	0	0	0	158	177	210	0	0	0	0	545	30	51	0	71	616	0	0
150	WAKOH	92	35	59	45	42	40	49	0	0	0	0	0	0	362	29	0	0	29	391	0	1
151	WALLUPE VALLEY	13	12	15	15	10	18	0	0	0	0	0	0	0	83	7	0	0	7	90	0	0
152	WASHINGTON MID	0	0	0	0	0	279	325	359	0	0	0	0	0	963	15	54	0	69	1032	0	0
153	WALSON	52	80	87	90	74	87	0	0	0	0	0	0	0	510	42	0	0	42	552	5	1
HONOLULU DISTRICT		3444	2245	2401	2248	2229	2199	2102	2103	2203	2678	3021	2024	1864	28550	1173	472	1079	2724	31274	224	13

OEC-0708 BY SCH

schools	OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR													K-6	7-8	9-12	SPEED	GTOT PRSK'S PREPR				
	SCH	K	1	2	3	4	5	6	7	8	9	10	11						12	RTOT		
CENTRAL DISTRICT																						
200 AEA EL	44	38	41	44	44	44	41	48	0	0	0	0	0	0	300	47	0	47	347	17	0	
202 AEA HI	0	0	0	0	0	0	0	0	0	0	357	269	302	193	1121	0	0	134	134	1265	0	0
203 AEA INT	0	0	0	0	0	0	0	0	266	329	0	0	0	0	695	0	0	72	667	0	0	
203 ALAAMU EL	131	89	103	88	94	92	80	0	0	0	0	0	0	0	677	46	0	46	723	13	3	
204 ALAAMU INT	0	0	0	0	0	0	0	0	383	334	0	0	0	0	717	0	0	76	793	0	0	
207 HALE KULA	115	107	99	86	85	88	0	0	0	0	0	0	0	0	560	64	0	64	624	11	2	
208 HALEIWA	24	16	16	19	25	14	29	0	0	0	0	0	0	0	143	24	0	24	167	6	0	
208 HELEMANO	118	90	84	82	66	65	0	0	0	0	0	0	0	0	505	68	0	68	573	7	2	
209 HOKAM	88	89	112	89	101	82	76	0	0	0	0	0	0	0	637	51	0	51	688	14	0	
210 IIAHI	76	63	61	60	57	79	0	0	0	0	0	0	0	0	386	46	0	46	444	1	1	
211 KUALA	117	85	76	88	83	82	0	0	0	0	0	0	0	0	551	80	0	80	631	13	0	
212 KIPAPA	0	0	0	0	0	0	0	0	0	0	488	436	354	328	1604	0	0	303	303	1907	0	0
214 LELEHUA HI	82	88	68	71	65	68	76	0	0	0	0	0	0	0	448	38	0	38	486	7	1	
216 MILLANE HI	0	0	0	0	0	0	0	0	0	0	617	552	521	480	2170	0	0	302	302	2472	0	0
240 MILLANE KE	177	175	175	165	151	135	0	0	0	0	0	0	0	0	978	81	0	81	1059	15	0	
241 MILLANE MAUKA	129	116	106	130	117	114	0	0	0	0	0	0	0	0	702	57	0	57	769	10	0	
238 MILLANE MD	0	0	0	0	0	0	521	554	534	0	0	0	0	0	1509	62	153	0	215	1814	0	0
242 MILLANE ULA	114	93	104	101	106	122	0	0	0	0	0	0	0	0	640	60	0	60	690	9	4	
234 MILLANE VAHANA	88	80	86	100	86	87	0	0	0	0	0	0	0	0	537	60	0	60	595	14	0	
217 MOANALUA EL	74	90	99	101	109	105	110	0	0	0	0	0	0	0	686	34	0	34	722	10	0	
218 MOANALUA HI	0	0	0	0	0	0	0	0	0	0	522	470	429	382	1803	0	0	191	191	1994	0	0
218 MOANALUA MD	0	0	0	0	0	0	0	0	382	400	0	0	0	0	702	0	60	0	842	0	0	
220 MOANALUA	90	74	66	69	60	73	44	0	0	0	0	0	0	0	476	36	0	36	512	8	1	
221 NIMITZ	38	56	62	45	47	41	36	0	0	0	0	0	0	0	325	41	0	41	366	8	0	
222 PEARL HARBOR	69	83	80	60	77	69	70	0	0	0	0	0	0	0	508	52	0	52	560	11	0	
233 PEARL HARBOR KAI	78	75	68	67	60	59	38	0	0	0	0	0	0	0	435	73	0	73	508	11	4	
240 PEARL RIDGE	84	79	88	76	78	71	74	0	0	0	0	0	0	0	550	28	0	28	579	4	1	
234 RADFORD HI	0	0	0	0	0	0	0	0	0	0	306	289	274	224	1103	0	0	122	122	1226	0	0
226 RED HILL	58	32	49	57	43	64	37	0	0	0	0	0	0	0	340	26	0	26	366	8	2	
228 SALT LAKE	52	119	102	98	97	114	101	0	0	0	0	0	0	0	721	58	0	58	779	10	1	
227 SCOTT	60	55	80	60	71	62	71	0	0	0	0	0	0	0	449	45	0	45	494	6	3	
228 SHAFER	32	32	33	31	24	16	11	0	0	0	0	0	0	0	189	25	0	25	194	4	1	
226 SOLOMON	165	140	143	102	106	92	0	0	0	0	0	0	0	0	748	59	0	59	807	33	4	
229 WAHAWA EL	91	68	67	64	62	65	0	0	0	0	0	0	0	0	417	49	0	49	466	11	1	
230 WAHAWA MD	0	0	0	0	0	0	0	232	235	265	0	0	0	0	713	55	77	0	132	865	0	0
231 WAHAWA EL	71	74	83	67	67	61	65	0	0	0	0	0	0	0	478	43	0	43	521	7	1	
232 WAHAWA HI & INT	0	0	0	0	0	0	0	0	88	106	89	77	83	84	508	0	28	82	111	649	0	0
233 WAIMALU	81	72	70	65	75	64	70	0	0	0	0	0	0	0	487	64	0	64	551	14	0	
235 WAILING	71	68	72	67	65	79	67	0	0	0	0	0	0	0	489	35	0	35	524	8	0	
236 WAILER EL	110	101	83	85	84	84	0	0	0	0	0	0	0	0	557	74	0	74	631	11	5	
237 WAILER MD	0	0	0	0	0	0	0	209	193	159	0	0	0	0	566	25	64	0	89	656	0	0
CENTRAL DISTRICT	2614	2587	2423	2289	2242	2196	2065	2108	2117	2379	2093	1973	1689	28585	1965	531	111	3330	31815	396	39	

[illegible]

OEC-0708 BY SCH

schoolcode	SCH	OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR												RTOT	K-6	7-8	9-12	SPEED	G TOT FROM S PREVIOUS			
		K	1	2	3	4	5	6	7	8	9	10	11							12		
<u>WINDWARD DISTRICT</u>																						
305	KAUNAHU	55	56	47	61	55	34	53	0	0	0	0	0	0	365	44	0	44	410	0	7	
300	KAHAI	72	59	63	59	71	63	64	0	0	0	0	0	0	461	35	0	35	496	4	0	
301	CASTLE HI	0	0	0	0	0	0	0	0	383	202	323	200	1253	0	0	204	204	1552	0	0	
302	KAHAIKULU LAKE	75	55	55	57	42	44	37	0	0	0	0	0	0	365	31	0	31	396	2	0	
303	KAHULA	38	42	31	38	35	26	29	0	0	0	0	0	0	240	35	0	35	275	2	0	
304	HEHA	63	71	71	60	82	66	55	0	0	0	0	0	0	463	46	0	46	514	13	3	
305	KAHANA	23	16	17	14	18	27	20	0	0	0	0	0	0	135	12	0	12	147	0	0	
306	KALEIFULU	23	23	26	26	22	19	23	0	0	0	0	0	0	173	13	0	13	191	0	0	
306	KAHALU	33	23	24	24	31	13	30	0	0	0	0	0	0	183	47	0	47	230	6	1	
301	KAHUKU EL	69	65	75	65	63	67	55	0	0	0	0	0	0	453	42	0	42	501	3	1	
307	KAHUKU HI	0	0	0	0	0	0	0	352	253	206	281	216	214	1527	0	61	148	209	1736	0	0
308	KAHULA EL	52	47	45	45	40	37	43	0	0	0	0	0	0	316	50	0	50	366	9	0	
309	KAHULA HI	0	0	0	0	0	0	0	0	254	175	215	173	319	0	0	159	159	933	0	0	
310	KAHULA INT	0	0	0	0	0	0	0	253	324	0	0	0	0	617	0	89	0	89	706	0	0
311	KAHULA	70	66	79	74	60	79	60	0	0	0	0	0	0	433	43	0	43	536	9	0	
312	KALAEHO HI	0	0	0	0	0	0	0	0	0	222	190	195	192	799	0	0	123	922	0	0	
313	KAMEHOE	101	85	83	71	85	65	87	0	0	0	0	0	0	533	31	0	31	614	5	1	
315	KAPUNAHULA	74	77	87	77	78	78	63	0	0	0	0	0	0	535	41	0	41	576	4	0	
317	KOOLU	35	12	12	12	19	24	29	0	0	0	0	0	0	155	22	0	22	178	6	0	
318	KONGINT	0	0	0	0	0	0	0	278	317	0	0	0	0	585	0	113	0	703	0	0	
319	KAE	90	92	84	79	65	86	81	0	0	0	0	0	0	577	32	0	32	609	10	1	
321	KALANALU	69	44	53	53	53	51	40	0	0	0	0	0	0	363	47	0	47	415	3	0	
322	KONAPU	142	117	113	96	70	74	63	0	0	0	0	0	0	630	70	0	70	750	33	4	
475	LOMAHA	0	0	0	0	0	0	0	8	16	26	26	20	11	107	0	3	69	72	179	0	0
323	PARKER	32	37	31	43	27	37	54	0	0	0	0	0	0	261	53	0	53	318	13	0	
324	TOPE	35	42	39	27	32	33	33	0	0	0	0	0	0	252	27	0	27	279	8	37	
325	SUNSET BEACH	42	23	20	28	35	29	29	0	0	0	0	0	0	205	27	0	27	233	14	2	
326	WAIHOLE	51	54	55	50	44	46	46	0	0	0	0	0	0	346	41	0	41	387	3	3	
327	WAIMANALO EL & INT	8	0	8	7	9	14	9	0	0	0	0	0	0	55	13	0	13	68	4	0	
43		36	44	37	45	37	45	37	85	80	0	0	0	0	404	37	28	0	55	519	4	0
1201	WINDWARD DISTRICT	1147	1185	1103	1079	1055	1031	1031	927	935	1131	935	970	850	12349	854	234	803	12500	180	81	

OEC-0708 BY SCH

OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR																						
Schools	SCH	K	1	2	3	4	5	6	7	8	9	10	11	12	RTOT	K-4	7-8	9-12	SPEED	G TOT PRSK 5 PRGR		
HAWAII DISTRICT																						
301 DE SILVA		46	44	52	45	42	54	50	0	0	0	0	0	0	333	34	0	0	34	367	6	1
302 HAHNEO		20	21	23	24	16	25	15	0	0	0	0	0	0	144	10	0	0	10	154	0	0
305 HLO HI		0	0	0	0	0	0	0	0	0	322	317	334	267	1240	0	0	261	261	1401	0	0
306 HLO INT		0	0	0	0	0	0	0	219	209	0	0	0	0	428	0	79	0	79	507	0	0
307 HLO UNION		61	62	70	59	52	51	65	0	0	0	0	0	0	430	63	0	0	63	493	6	0
308 HOLLALCA		99	81	76	62	69	61	0	0	0	0	0	0	0	448	23	0	0	23	471	0	0
309 HONALULU		33	31	31	16	17	16	0	0	0	0	0	0	0	124	13	0	0	13	137	6	12
311 HONOKAA EL		47	59	49	44	36	50	56	0	0	0	0	0	0	343	36	0	0	36	381	4	0
300 HONOKAA HI & INT		0	0	0	0	0	0	0	42	62	142	163	141	145	6815	0	18	134	102	837	0	0
303 HOOKINA		29	12	22	19	24	13	0	0	0	0	0	0	0	118	23	0	0	23	142	3	7
371 KAHUKA		101	89	81	80	91	77	0	0	0	0	0	0	0	519	83	0	0	83	602	4	6
305 KALANIPOLE EL & INT		34	36	30	33	30	30	31	34	30	0	0	0	0	284	31	9	0	40	334	0	0
307 KAPOLANI		55	49	53	55	47	33	60	0	0	0	0	0	0	352	50	0	0	50	402	5	0
308 KAU HAPAHALA EL		21	15	14	19	15	13	14	22	51	66	67	61	62	420	24	23	49	96	516	0	0
309 KAUHANA		41	27	32	28	29	33	16	0	0	0	0	0	0	208	20	0	0	20	229	0	0
378 KE KULA O EHUNUKUMAU		21	22	15	19	13	12	14	14	7	5	4	12	1	159	5	2	7	14	173	0	0
303 KEAAUEL		119	118	106	104	114	106	0	0	0	0	0	0	0	638	92	0	0	92	750	11	1
304 KEAAUHI		0	0	0	0	0	0	0	0	0	263	182	183	134	752	0	0	218	218	970	0	0
370 KEAUMOI		0	0	0	0	0	0	165	176	173	0	0	0	0	514	28	62	0	90	604	0	0
300 KEAUAHE HI		154	163	143	153	140	148	0	0	0	0	0	0	0	804	80	0	0	80	884	18	1
302 KEAUAHE INT		0	0	0	0	0	0	0	0	0	410	342	355	336	1446	0	0	152	152	1638	0	0
372 KEAUAHA		55	36	36	31	36	34	37	0	0	0	0	0	0	265	30	0	0	30	295	0	0
301 KEONISFOKO		83	75	89	79	79	70	79	0	0	0	0	0	0	554	100	0	0	100	654	11	0
305 KOHALA EL		57	55	54	52	63	47	0	0	0	0	0	0	0	331	58	0	0	58	389	13	2
373 KOHALA HI		0	0	0	0	0	0	0	0	0	50	53	56	60	219	0	0	64	64	283	0	0
306 KOHALA MO		0	0	0	0	0	0	0	68	63	63	0	0	0	174	11	23	0	34	208	0	0
375 KONAWAENA EL		80	83	90	84	87	83	0	0	0	0	0	0	0	540	37	0	0	37	577	6	1
374 KONAWAENA HI		0	0	0	0	0	0	0	0	0	166	179	183	131	659	0	0	95	95	754	0	0
376 KONAWAENA MO		0	0	0	0	0	0	0	0	0	0	0	0	0	367	14	44	0	58	410	0	0
377 LAUPAHOE HI & EL		13	20	15	14	15	9	11	14	13	7	16	6	7	160	10	8	22	40	200	6	0
379 MT VERN EL		84	71	87	69	66	66	0	0	0	0	0	0	0	422	48	0	0	48	470	11	0
300 MALEHU		55	52	43	57	43	42	43	42	0	0	0	0	0	317	35	12	0	47	414	8	0
302 MAUL O EL & INT		19	21	29	25	22	24	22	22	20	18	0	0	0	222	10	6	3	19	241	0	0
381 PAKOAE EL		48	53	47	46	37	44	42	0	0	0	0	0	0	317	44	0	0	44	361	3	0
303 PAKOAE INT		0	0	0	0	0	0	0	0	0	126	108	97	83	584	0	45	127	172	765	0	0
384 WAKA EL		129	129	126	127	128	121	0	0	0	0	0	0	0	789	69	0	0	69	858	7	0
308 WAKA HI		0	0	0	0	0	0	0	0	0	288	285	301	251	1136	0	0	140	140	1276	0	0
305 WAKA INT		0	0	0	0	0	0	235	261	265	0	0	0	0	781	35	77	0	112	893	0	0
306 WAKA WAKAENA		132	95	127	115	112	126	0	0	0	0	0	0	0	707	57	0	0	57	764	8	0
303 WAKOLOA		102	84	60	75	84	78	72	0	0	0	0	0	0	565	46	0	0	46	611	8	10
307 WAKOEA EL		99	109	98	95	98	86	0	0	0	0	0	0	0	585	50	0	0	50	635	7	2
HAWAII DISTRICT																						
1851	1735	1637	1620	1596	1561	1516	1387	1380	1837	1705	1718	1474	21077	1239	477	1302	3018	24995	151	43		

DEC-0708 BY SCH

schools	SCH	OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR												K-6	7-8	9-12	SPEED	G TOT PRSKS PREPR
		K	1	2	3	4	5	6	7	8	9	10	11					
MAUI DISTRICT																		
400	BALDWIN HI	0	0	0	0	0	0	0	0	0	424	318	343	301	1390	0	0	0
401	HAKU	77	68	66	65	71	57	0	0	0	0	0	0	0	405	36	0	0
402	HANA HI & EL	36	29	15	23	12	25	30	22	30	20	24	22	18	276	23	8	2
404	MOINT	0	0	0	0	0	0	262	267	231	0	0	0	0	760	23	0	0
405	KAHULU	148	136	129	145	122	134	0	0	0	0	0	0	0	814	43	0	0
420	KALAMA INT	0	0	0	0	0	0	247	262	264	0	0	0	0	763	38	0	0
421	KAMALI	85	100	114	88	98	81	0	0	0	0	0	0	0	606	44	0	0
426	KAMERAWAHI II	154	77	129	97	95	102	0	0	0	0	0	0	0	654	47	0	0
427	KALUKAKAI	43	24	30	24	19	28	23	0	0	0	0	0	0	191	40	0	0
428	KEANAE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
429	KEKAUKE HI	0	0	0	0	0	0	0	0	0	319	279	291	241	1130	0	0	0
428	KIHEI	132	107	115	130	142	123	0	0	0	0	0	0	0	757	42	0	0
410	KILOHANA	22	11	15	15	13	8	14	0	0	0	0	0	0	98	13	0	0
412	KULA	101	48	77	71	55	70	0	0	0	0	0	0	0	423	32	0	0
413	LAIHANA INT	0	0	0	0	0	0	0	0	0	276	303	220	190	869	0	0	0
414	LAIHAINALUNA HI	40	34	38	44	29	32	34	38	35	36	38	32	38	468	37	28	0
415	LAIHI HI & EL	103	101	175	149	103	143	0	0	0	0	0	0	0	929	77	0	0
416	LHIKA	0	0	0	0	0	0	109	182	205	5	0	0	0	691	22	38	0
420	LOKELANI INT	80	74	70	60	70	65	0	0	0	0	0	0	0	436	57	0	0
417	MAKAWAO	0	0	0	0	0	0	0	0	0	428	383	375	319	1505	0	0	0
418	MAUI HI	0	0	0	0	0	0	0	0	0	0	0	0	0	597	39	79	0
428	MAUI WANA INT	0	0	0	0	0	0	303	304	290	0	0	0	0	60	2	0	0
419	MAUNALO	10	7	11	7	8	8	7	0	0	0	0	0	0	120	0	27	0
421	MOLOKAI HI	0	0	0	0	0	0	0	0	0	73	73	87	82	316	0	0	0
404	MOLOKAI MID	0	0	0	0	0	0	0	0	0	0	0	0	0	187	11	0	0
423	NAHIKENA	104	75	101	83	88	103	0	0	0	0	0	0	0	559	65	0	0
422	PAHA	40	38	31	34	25	29	0	0	0	0	0	0	0	197	11	0	0
423	POWERS	57	46	49	60	53	35	0	0	0	0	0	0	0	302	25	0	0
426	RUKALANI	78	68	72	70	71	76	0	0	0	0	0	0	0	436	44	0	0
424	WAHEE	130	115	125	121	124	125	0	0	0	0	0	0	0	751	69	0	0
425	WAILUKU	163	124	129	134	116	159	0	0	0	0	0	0	0	825	69	0	0
MAUI DISTRICT																		
1653		1385	1500	1448	1381	1410	1315	1286	1214	1591	1318	1370	1159	1199	19098	934	340	29

DEC-0708 BY SCH

OFFICIAL ENROLLMENT COUNT, 2007-08 SCHOOL YEAR																				
schools	K												GTOT PRSK & PRSKR							
	1	2	3	4	5	6	7	8	9	10	11	12		RTOT	K-6	7-8	9-12	SPED		
<u>SPECIAL SCHOOLS</u>																				
470 HOGS	0	0	0	0	0	0	0	0	0	1	0	0	1	22	21	28	71	72	7	0
144 JEFFERSON ORTHOPEDIC	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	16	16	3	0
495 POMUKANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>SPECIAL SCHOOLS</u>																				
	0	0	0	0	0	0	0	0	0	1	0	0	1	37	21	28	88	87	10	0

