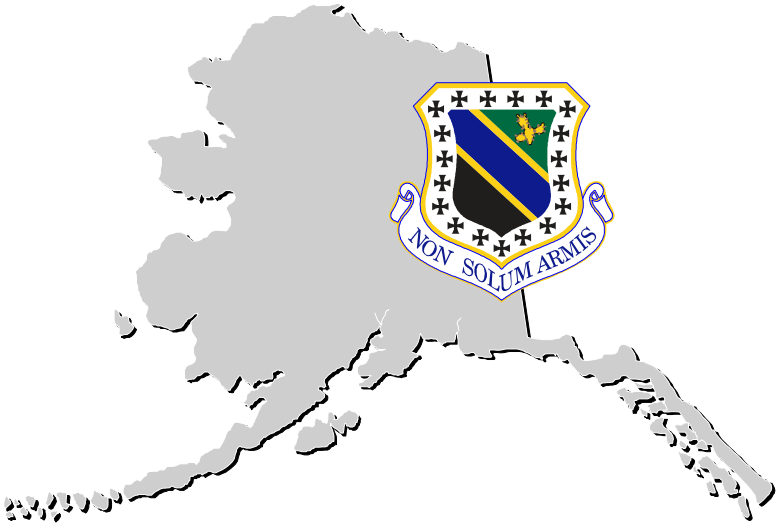

UNITED STATES AIR FORCE
ELMENDORF AIR FORCE BASE, ALASKA

ENVIRONMENTAL ASSESSMENT

PHASE II PRIVATE SECTOR FINANCED MILITARY FAMILY HOUSING ELMENDORF AFB, ALASKA

JUNE 2004

ENVIRONMENTAL ASSESSMENT

PHASE II
PRIVATE SECTOR FINANCED
MILITARY FAMILY HOUSING

ELMENDORF AIR FORCE BASE, ALASKA

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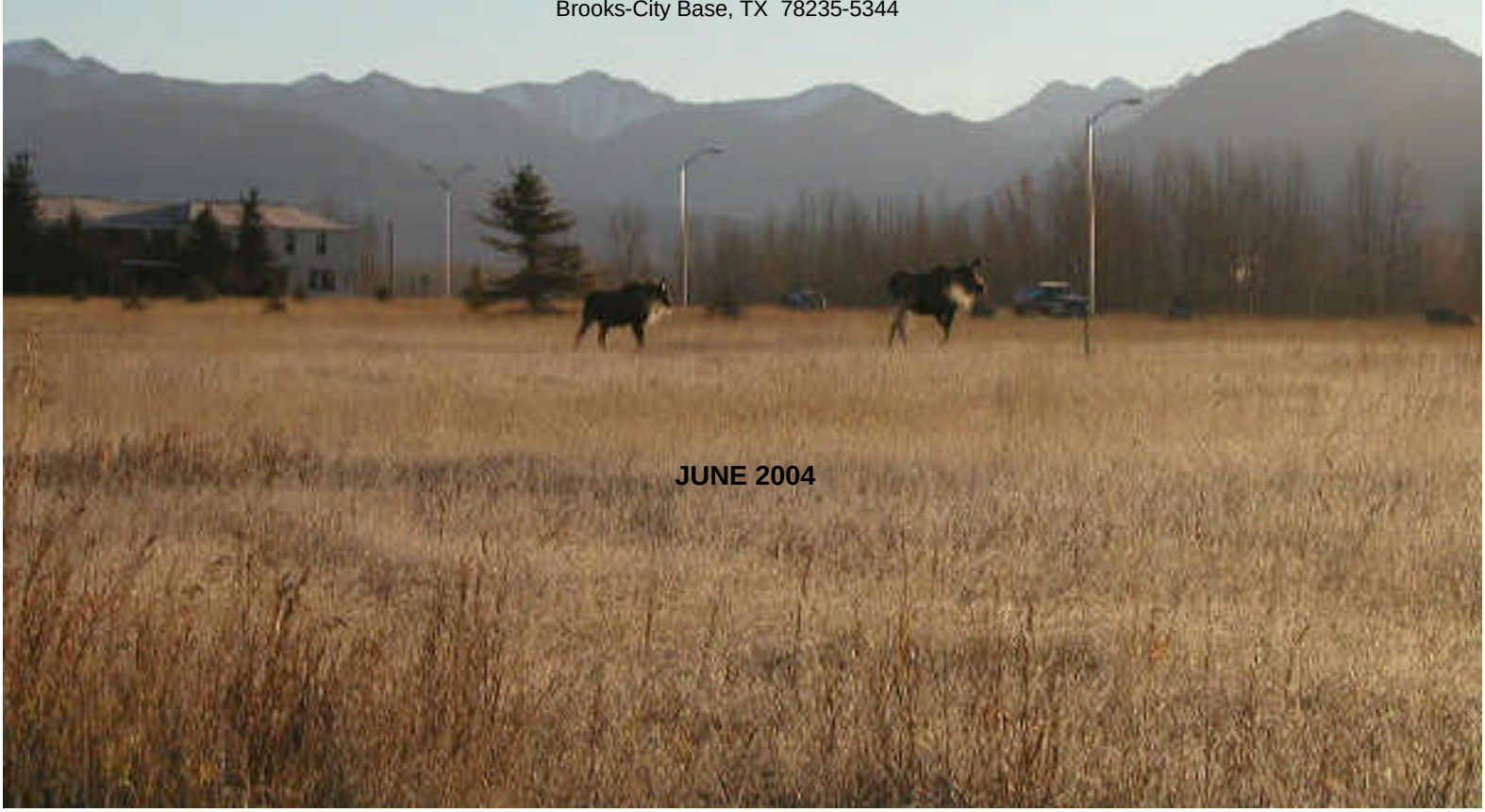

JUNE 2004

COVER SHEET

ENVIRONMENTAL ASSESSMENT
PHASE II PRIVATE SECTOR FINANCED MILITARY FAMILY HOUSING
ELMENDORF AIR FORCE BASE, ALASKA

Responsible Agency: Department of the Air Force, 3rd Mission Support Group, 3rd Civil Engineer Squadron, Elmendorf Air Force Base (AFB), Alaska

Proposed Action: Phase II Private Sector Financed Military Family Housing at Elmendorf AFB

Report Designation: Environmental Assessment (EA)

Abstract: The purpose of the Proposed Action is to provide military family housing (MFH) on Elmendorf AFB that meets Air Force housing standards by conveying 986 MFH units, constructing 208 new MFH units (total of 1,194 MFH units) and leasing undeveloped land to a contractor who would be responsible for renovation, demolition/construction of MFH on Elmendorf AFB. Due to advancing age and deterioration, many of these units require extensive maintenance and repair, and no longer meet current Air Force family housing standards. The Proposed Action would include the lease of approximately 352 acres of land on the adjacent U.S. Army Fort Richardson. This land would be transferred to Elmendorf AFB, and be leased to the contractor who would construct approximately 570 of the housing units and a new access road on this property. This EA evaluates the Proposed Action, the No Action Alternative, the Alternative Action, and the cumulative impacts of other actions announced for the project area. Under the No Action Alternative, military personnel and dependents would continue to reside in the existing MFH units on Elmendorf AFB. Resources considered in the impact analysis were: noise; land use; air quality; water resources, hazardous materials and wastes; biological resources; cultural resources; geological resources; infrastructure and utilities; public services; and, safety. With the incorporation of specific design features and best management practices, including the preparation of a Moose Habitat Compensation Plan by the Air Force, significant impacts would not be expected to result from the Proposed Action, Alternative Action, or the No Action Alternative.

Comments: The public review period for this document closed on 30 March 2004. Written comments and inquiries regarding this document should be directed to: Mr. Jon Scudder, 3rd Wing Public Affairs, Environmental Community Affairs Coordinator, 10480 22nd Street, Suite 118, Elmendorf AFB, AK 99506. Phone: (907) 552-8970 Fax: (907) 552-5111.

Privacy Advisory: Letters or other written comments on the Draft EA were accepted by the Air Force through 30 March 2004. As required by law, comments were addressed in this Final EA and are made available to the public. Due to privacy requirements, only the names of the individuals making comments and specific comments have been disclosed. Personal home addresses and phone numbers have not been published in the Final EA.

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ACRONYMS AND ABBREVIATIONS

ACM	asbestos containing material
ADEC	Alaska Department of Environmental Conservation
AF	Air Force
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AF FHMP	Air Force Family Housing Master Plan
AFI	Air Force Instruction
AFM	Air Force Manual
AICUZ	air installation compatible use zone
AIHA	American Industrial Hygiene Association
AIRFA	American Indian Religious Freedom Act
AK	Alaska
AMP	asbestos management plan
ANSI	American National Standards Institute
AOC	Area of Concern
APZ	Accident Potential Zone
AQCR	air quality control region
AR	Army Regulation
ARPA	Archaeological Resources Protection Act
AUL	Authorized User List
B.A.	Bachelor of Arts
BAH	Basic Allowance for Housing
BASH	Bird-Aircraft Strike Hazard
BCE	Base Civil Engineer
BEZ	Bird Exclusion Zone
Bldg	Building
BLM	U.S. Bureau of Land Management
BMP	best management practice
B.S.	Bachelor of Science
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERL	Construction Engineering Research Laboratory
CES	Civil Engineer Squadron
cfs	cubic feet per second
CFR	Code of Federal Regulations
CO	carbon monoxide
CRM	Cultural Resources Manager
dB	decibel
dBA	A-weighted sound level

DNL	day-night average sound level
DNR	Alaska Department of Natural Resources
DoD	Department of Defense
DoDD	Department of Defense Directive
EA	environmental assessment
ECOP	Environmental Condition of Property
EIAP	environmental impact analysis process
EIS	environmental impact statement
EMF	electric and magnetic fields
EMS	environmental management system
EMS	emergency medical services
E.O.	Executive Order
EOD	Explosive Ordnance Disposal
EPA 17	Products containing the 17 chemicals listed under the voluntary 33/50 USEPA Industrial Toxics Program
EPCRA	Environmental Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESOHCAMP	Environmental Safety and Occupational Health Compliance and Management Program
ESPC	Energy Savings Performance Contract
F	Fahrenheit
FAA	Federal Aviation Administration
FFA	Federal Facilities Agreement
FICON	Federal Interagency Committee on Urban Noise
FO/CO	Field Grade Officer/Company Grade Officer
FONSI	finding of no significant impact
FR	Federal Register
ft	foot (feet)
FY	fiscal year
GOQ	General Officers' Quarters
HAZMAT	hazardous materials
HAZWASTE	hazardous wastes
HCP	Housing Community Plan
HQ	headquarters
HRMA	Housing Requirements and Marketing Analysis
HUD	Housing and Urban Development
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
kw	kilowatt
lb	pound
lb/ft^3	pound per cubic foot
LBP	lead based paint

L_{eq}	equivalent sound level
L_{max}	maximum sound level
LUC	land use control
M.A.	Master of Arts
MFH	military family housing
mgd	million gallons per day
$\mu g/m^3$	micrograms per cubic meter
MHPI	Military Housing Privatization Initiative
MILCON	military construction
M.P.H.	Master of Public Health
M.S.	Master of Science
MSGP	Multiple-Sector General Permit
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NFA	No Further Action Required
NHPA	National Historic Preservation Act
NLR	noise level reduction
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
O_3	ozone
OHA	Alaska Office of History and Archaeology
ODS	ozone depleting substance
OMB	U.S. Office of Management and Budget
OSHA	Occupational Safety and Health Act
OU	Operable Unit
PAM	Army Pamphlet
P2	Pollution Prevention
P2 MAP	Pollution Prevention Management Action Plan
PACAF	Pacific Air Forces
Pb	lead
PCB	polychlorinated biphenyls
pCi/L	picoCuries per liter
P.L.	Public Law
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
POL	petroleum, oil and lubricants
ppm	parts per million
PPOA	Pollution Prevention Opportunity Assessment
PSD	Prevention of Significant Deterioration

PSF	private sector financed
PVC	polyvinyl chloride compound
PWTB	Public Works Technical Bulletin
RAL	radon action level
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
Sec.	Section
SEL	sound exposure level
SERA	Alaska State - Environmental Restoration Agreement
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SO_x	sulfur oxides
SWPPP	Storm Water Pollution Prevention Plan
TLF	transient living facility
tons/yr	tons per year
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
U.S.	United States
USAF	United States Air Force
USARAK	United States Army, Alaska
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USDOT	United States Department of Transportation
UST	underground storage tank
VA	Veterans Administration
VOC	volatile organic compounds
yr	year

CHAPTER 1
PURPOSE AND NEED

This chapter has five sections: the purpose of and need for the Proposed Action; the location of the Proposed Action; a summary of the scope of the environmental review; identification of the biophysical resources applicable to the environmental assessment; and, a listing of applicable regulatory requirements.

1.1 PURPOSE AND NEED FOR ACTION

The purpose of the action is to provide military family housing (MFH) for military personnel stationed at Elmendorf Air Force Base (AFB), Alaska. A limited number of MFH units on Elmendorf AFB are also provided to military personnel stationed at Fort Richardson. The Air Force is committed to adequately housing its members and responsibly managing its housing resources because productivity and retention of USAF members greatly depend on such actions (per Air Force Policy Directive 32-60, *Housing*). Properly designed and furnished quarters providing some degree of individual privacy are essential to the military.

Housing to be provided must meet Air Force housing standards. Due to advancing age and continual deterioration, many existing MFH units on Elmendorf AFB require extensive maintenance and repair, and no longer meet Air Force family housing standards. Additionally, many of these MFH units have deteriorated beyond the reasonable cost of whole unit renovation. The housing must be upgraded to meet current life safety codes and to provide a suitable living environment comparable to the off-base community, in accordance with Air Force guidelines for quality of life and floor space requirements.

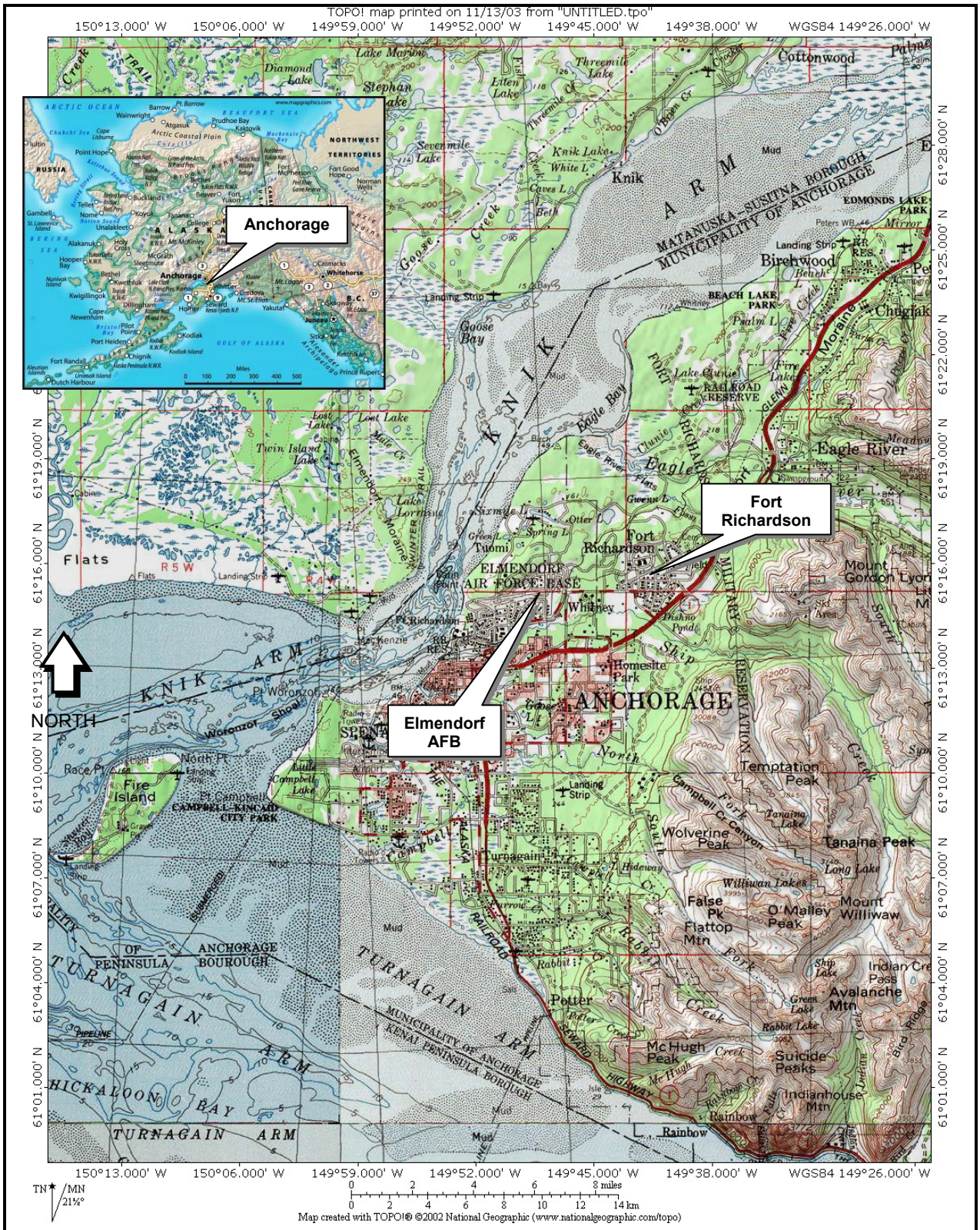
Conventional funding for military housing construction has been supplemented with military housing privatization initiatives. Privatization would accelerate the Base's ability to provide military families access to safe, quality, affordable housing in a community in which the members choose to live. The action will provide suitable family housing for military personnel stationed at Elmendorf AFB. The action is needed to provide a long-term solution to housing availability and maintenance considerations.

1.2 LOCATION OF THE PROPOSED ACTION

Elmendorf AFB is located in south-central Alaska (latitude/longitude: 61º15'N/149º18'W) north of Anchorage. The Base is bordered on the east by Fort Richardson (U.S. Army Alaska), and on the south by residential, industrial, and business districts of Anchorage. Elmendorf AFB is bordered on the north and west by the Knik Arm of Cook Inlet. The Base is comprised of 13,103 acres of land as of 20 December 2001. Figure 1 shows the location of Elmendorf AFB, Fort Richardson and surrounding areas.

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental assessment (EA). The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 CFR Sections 1500-1508) and 32 CFR 989 (*Air Force Environmental Impact Analysis Process*), 15 Jul 99, and amended 28 Mar 01. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure



Location of Elmendorf Air Force Base and Fort Richardson, Alaska

Figure 1

that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an EA:

- Briefly provide evidence and analysis to determine whether the Proposed Action might have significant effects that would require preparation of an environmental impact statement (EIS). If the analysis determines that the environmental effects will not be significant, a finding of no significant impact (FONSI) will be prepared; or,

- Facilitate the preparation of an EIS, when required.

This EA assesses the proposed renovation, demolition, and construction of Phase II private sector financed (PSF) housing units at Elmendorf AFB and the proposed construction of housing on Fort Richardson land that would be transferred from the U.S. Army. This study evaluates the potential environmental impacts that may result from the implementation of the Proposed Action as well as possible cumulative impacts from other actions planned for the Base. The EA also identifies required environmental permits relevant to the Proposed Action. As appropriate, the affected environment and environmental consequences of the Proposed Action may be described in terms of site-specific descriptions or regional overview. Finally, the EA identifies mitigation measures to prevent or minimize environmental impacts, as required.

1.4 IDENTIFICATION OF BIOPHYSICAL RESOURCES APPLICABLE TO THE ENVIRONMENTAL ASSESSMENT

The following biophysical resources were identified for study at Elmendorf AFB: noise; land use (including recreation); air quality; water resources; hazardous materials and wastes; biological resources; cultural resources; geological resources; infrastructure and utilities; transportation systems; public services; and, safety.

Initial environmental analyses indicated that the proposed activities would not result in either short- or long-term impacts to the Air Installation Compatible Use Zone program, visual resources, socioeconomics or environmental justice. The reasons for not addressing this and other subjects are discussed in the following paragraphs:

- **Air Installation Compatible Use Zone Program and Airspace and Airfield Operations.** The Proposed Action would not involve any aircraft or result in any aircraft operations, nor would it result in any change in existing and planned aviation activities in the vicinity of the housing areas on Elmendorf AFB. For this reason, accident potential, encroachment, airspace and airfield operations are not evaluated in this EA.

- **Visual Resources.** The proposed Phase II PSF housing would be designed in same architectural style characterized by existing housing areas on Elmendorf AFB. No change in visual character of the housing area, or loss of scenic views, would be expected to result on Elmendorf AFB from the Proposed Action. New housing units that would be constructed on Fort Richardson would be designed to be compatible with the architectural character of the area consistent with applicable Air Force standards and guidance. Placement of housing on property to be acquired from Fort Richardson would not result in loss of scenic views. For these reasons, visual resources are not evaluated in this EA.

- **Socioeconomics.** There would be no change in the number of personnel authorizations at Elmendorf AFB as a result of the Proposed Action. Thus, no long-term changes would be anticipated to area population, housing requirements, school enrollment, or economic factors (*i.e.*, sales volume, income, or employment). It is not anticipated that construction workers would relocate to the Anchorage area as a result of the proposed construction. The Proposed Action would result in construction of an additional 208 housing units on Elmendorf AFB which would result in 208 fewer military families that would occupy rental units in the Anchorage area. This would result in an

increase of 0.21 percent in the rental vacancy rate in Anchorage. The additional 208 units would be expected to generate approximately 312 additional school-age students, resulting in a 0.63 percent increase in enrollment in the Anchorage School District. No substantial change to economic factors from the proposed construction activities or long-term operation would be expected to result from housing privatization. For these reasons, socioeconomic resources were not considered significant are not assessed in this EA.

- **Environmental Justice.** Based on the analyses conducted for this EA, it was determined that activities associated with the Proposed Action would not have adverse effects at any location for noise, land use, air quality or cultural resources. Since the Proposed Action would not have any adverse effect, no disproportionately high and adverse impacts upon minority and low-income populations would be anticipated. Therefore, impacts on environmental justice would not be anticipated and is not evaluated in this EA.

The baseline conditions used for the environmental evaluation in this EA are assumed to be Fiscal Year (FY) 2004.

1.5 APPLICABLE REGULATORY REQUIREMENTS

Potential regulatory permits applicable to the Proposed Action are presented in Table 1. The Proposed Action may require environmental permits and amendments to existing permits. The selected privatization contractor or the appropriate demolition and construction contractor would be responsible for ensuring that applicable permits are identified and obtained from base, local, state, and federal agencies. The Air Force would coordinate permit requirements identified by the demolition and construction contractor during the project. The Air Force would coordinate regulatory requirements with the U.S. Army for activities on Fort Richardson.

Table 1. Potentially Required Federal Permits, Licenses, or Entitlements for Elmendorf AFB

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
National Pollutant Discharge Elimination System Permit	Actions to protect water resources from pollutants that may be carried by storm water runoff. A storm water discharge permit shall be required for construction activities that disturb soil on Elmendorf AFB.	Clean Water Act, P.L. 92-500, 33 U.S.C. et seq., 40 CFR Part 122	U.S. Environmental Protection Agency and Alaska Department of Environmental Conservation.
Archaeological Resources Protection Act Permit	Excavation and/or removal of archaeological resources from public lands or Indian lands and carrying out activities associated with such excavation and/or removal.	Archaeological Resources Protection Act of 1979, 16 U.S.C. Sec. 470cc	U.S. Department of the Interior - National Park Service

In addition to permit requirements, the Air Force will also be required to initiate the following consultation or coordination processes regarding the Proposed Action:

- Consultation with the Alaska State Historic Preservation Officer (SHPO) regarding the potential effects of the Proposed Action on cultural resources in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended and 36 CFR 800).

- Consultation with the Municipality of Anchorage (Planning, Development and Public Works), State of Alaska Department of Transportation, and U.S. Department of Transportation regarding design and

construction of the proposed roadway and associated connections from Elmendorf AFB to Fort Richardson, as appropriate.

- Consultation with the Alaska Department of Environmental Conservation, Division of Air and Water Quality, Watershed Management Section, to determine whether a wastewater disposal permit will be required during planned construction activities.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter has nine sections: a history of the formulation of alternatives; identification of alternatives eliminated from further consideration; a detailed description of the Proposed Action; a description of the No Action Alternative; a description of the Alternative Action; identification of other actions announced for the project area; a comparison of the environmental impacts of all alternatives; identification of the preferred alternative; and, a discussion of mitigation requirements.

2.1 HISTORY OF THE FORMULATION OF ALTERNATIVES

More than 38 percent of Air Force owned and operated family housing does not meet modern standards and requires either major improvement or replacement. Consequently, the Department of Defense (DoD) proposed, and Congress enacted, the Military Housing Privatization Initiative (MHPI) in the 1996 National Defense Authorization Act. This law provides authorizations that enable the Air Force to address its housing needs by utilizing privately financed and privately built MFH constructed to market standards. The goal of the MHPI is to drastically reduce the time required to provide military members with quality, affordable housing and replace its aging inventory of housing units. The MHPI assumes the authorizations will be extended by Congress to allow completion of all privatization projects identified in the Air Force Family Housing Master Plan (AF FHMP).

The AF FHMP articulates the Air Force investment strategy to meet housing needs through the use of traditional construction funding (i.e., Congressionally appropriated funds for MFH construction through the military construction [MILCON] program) and privatization. The plan identifies the most cost effective and time-efficient investment option for each installation (i.e., use of traditional construction options and/or the MHPI) to meet the housing requirements of military families consistent with Congressional and DoD directives. The Air Force recognizes that the military, social, and economic conditions that influence the plan are constantly changing. Accordingly, the plan allows for the incorporation of changes in conditions and the update of investment strategies, costs, and priorities.

The DoD has tasked the Air Force to upgrade inadequate housing by or before FY 2007 for bases in the continental U.S. and FY 2009 for all other bases. Previous studies projected that 5,000 new housing units in addition to the current Air Force-wide 104,000 unit inventory would be required to meet Air Force housing needs. Such an effort would cost the Air Force more than $7 billion in family housing funds. Sufficient funds are not projected to be available through the next ten years to meet this goal using traditional construction options.

The AF FHMP is compiled from each installation's family housing master plan. The FHMP for each installation identifies the existing inventory, the actions (and costs) required to meet modern standards, the remaining economic life of surplus housing, and the timing of the phase-out of surplus housing so that the local housing market is not disrupted. Each installation's plan also identifies the costs for various categories (utilities, maintenance, repair, and other residential services). In addition, the plan provides a preliminary assessment of the feasibility of privatization.

The AF FHMP identifies two criteria to determine the viability of housing privatization:

- **Economic Feasibility and Scored Cost.** The Office of Management and Budget (OMB) scored cost for housing privatization cannot exceed one third of the estimated MILCON cost to bring all housing units up to modern standards (referred to as a three-to-one leverage in budget authority). The scored cost is the amount of funds OMB requires the Air Force to budget in the current fiscal year to cover

the federal government's costs (and potential costs) associated with the loans, guarantees, and other financial obligations or future commitments being made.

- **Economic Feasibility and Life Cycle Costs.** Guidance requires that the life cycle costs associated with privatization be less than the life cycle costs for government ownership. The cost of privatization includes the OMB scored cost and the net present value of the expected Basic Allowance for Housing (BAH) for service members living in the privatized units. The life cycle costs of government ownership include the MILCON cost and the net present value of maintenance, repair, utilities, management, and any other services provided.

If both criteria are met, privatization is generally selected. If either of the two criteria is not met, the use of traditional construction options is generally selected. Military family housing at Elmendorf AFB meets the two privatization criteria. Therefore, privatizing MFH is viable for Elmendorf AFB.

The use of private financing cannot always eliminate the requirement for appropriated funds to support housing needs. However, privatization leverages the limited appropriated funds available for the project scored cost. The private sector is willing to invest its resources if the rents (i.e., BAH) and other Air Force inducements are sufficient to provide adequate cash flow and return on investment. These private funds are used to renovate and/or construct housing and related amenities traditionally financed through MILCON.

Housing areas on Elmendorf AFB are located in two primary locations on the southern portion of the Base. The existing MFH units at Elmendorf AFB were constructed from 1942 through 1965, and some housing areas have undergone whole house and neighborhood improvements in the 1990s. Remaining housing areas show the effects of age, continuous heavy use, and high occupant turnover. Units that have had no major upgrade since construction do not meet the needs of today's families. Bedrooms are small and lack adequate closet space. The units lack an adequate number of bathrooms. Fixtures are outdated and energy inefficient. Kitchens do not provide adequate dining arrangements or sufficient counter space. Roofs, walls, foundations and exterior pavements require major repair or replacement. In some areas, the electrical system has deteriorated and/or does not provide for 3-wire grounded service. The plumbing system is rusting through at subsurface traps, and line failures exist in the water system. The ventilation system is inefficient and needs to be upgraded. Building materials in the housing units that have not had major upgrades and are expected to contain asbestos and lead-based paint.

In 1996, the Air Force prepared a Military Family Housing Community Plan (HCP) for Elmendorf AFB. The objectives of the HCP were: to provide a comprehensive view of the MFH areas at Elmendorf AFB; develop a 20-year whole-neighborhood improvement program for the Base; identify specific housing deficiencies in the MFH areas; and identify solutions to meet these needs. The HCP was developed in accordance with the Family Housing Planning, Programming, Design and Construction Guidelines (AFI 32-6002), and applicable policies of the Pacific Air Forces (PACAF) and the Base.

A housing requirements and market analysis (HRMA) was conducted in 2003 to evaluate the housing market area surrounding Elmendorf AFB. The HRMA assesses the ability of the off-base housing market to provide housing for military personnel at Elmendorf AFB. Off-base housing must meet Air Force standards for location, cost, size and suitability. The HRMA was conducted for the years 2003 through 2008. The study found a current (2003) deficit of 310 suitable housing units for military families and a shortfall of 375 private sector rental housing units for unaccompanied personnel. The study also identified a projected (2008) deficit of 208 suitable housing units for military families and a shortfall of 115 private sector rental housing units for unaccompanied personnel. The study was conducted using 1,814 MFH units (housing assets in year 2004). The HRMA reflected that there are 6,868 military personnel (including 4,283 families) for whom Elmendorf AFB has housing responsibility. This number of personnel is expected to decrease to 6,816 military personnel in 2008 (USAF, 2003a).

In the first phase of the PSF housing program at Elmendorf AFB, the Air Force conveyed 584 MFH units to a contractor. Privatized housing (Phase I) includes 828 units located in the New Sunflower/Dallas, Silver Run and Chugach housing areas. A total of 986 MFH units at Elmendorf AFB remain under government control. The Proposed Action would result in conveyance of the remaining 986 MFH units to

a privatization contractor who would also construct up to 208 additional MFH to meet the projected deficit of units. This would result in a total of 1,194 MFH units on Elmendorf AFB.

Alternative authorities for providing of MFH have been available through the Build-to-Lease Program (10 U.S.C. 2835), rental guarantees in accordance with 10 U.S.C. 2836, and leasing of non-excess property in accordance with 10 U.S.C. 2667. Because of changes in budget scoring rules and the advent of housing privatization initiatives, these programs are no longer considered to be viable options.

Given the condition of the housing units on Elmendorf AFB and the demonstrated need for on-base housing, the Air Force decided to correct the deficiencies of these housing units. Given the need for additional land to meet the ongoing and projected need for housing at Elmendorf AFB via privatization, the Air Force identified three selection criteria for alternative sites:

- Military family housing must be located in areas that are not commercial or industrial in nature, and should be located in areas that do not experience noise levels in excess of 70 dBA. Although the Core Housing Area south of the runway is considered a high noise area, officers must be provided housing in this centralized area of Elmendorf AFB. Enlisted personnel can be provided housing in non-centralized areas of the Base.

- Housing units must be located within a reasonable driving distance from the Base to provide convenient access to Base facilities, including joint facilities; and,

- Housing should be sited on land of sufficient size so that a contiguous community setting can be provided in accordance with Air Force housing standards.

The Air Force identified three candidate sites for the construction of replacement and new housing: parcels adjacent to existing housing on Elmendorf AFB; land on the north side of Elmendorf AFB; and, land on Fort Richardson immediately east of Elmendorf AFB. The evaluation of candidate sites is shown in Table 2.

Table 2. Evaluation of Alternative Sites

Alternative	Meets Alternative Selection Criteria		
	Located in Area With Noise Level < 70 dBA	Within Reasonable Distance from Core of Base	Provides Contiguous Community Setting
Use of Adjacent Parcels on Elmendorf AFB	No	Yes	Yes
North Side of Elmendorf AFB	No	No	Yes
Land on Fort Richardson	Yes	Yes	Yes

As shown in Table 2, two of the three alternative sites did not meet all the selection criteria. The future land use designation for the candidate site on Fort Richardson is designated as housing. For these reasons, 352 acres of land on Fort Richardson was identified as the proposed site for construction of additional housing for Elmendorf AFB.

2.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The Air Force considered a range of alternatives that would provide military family housing (MFH) for military personnel stationed at Elmendorf AFB. The reasons for eliminating preliminary alternatives are described herein.

2.2.1 MILCON Funding for Housing Construction

Traditional military construction using appropriated funds, or MILCON funding, for the construction of replacement and/or new housing was identified as an alternative for providing MFH on Elmendorf AFB.

The Air Force plans to continue to use a combination of MILCON funding and private sector investment to meet the DoD 2007/2009 housing goal. Traditional housing MILCON sources for bringing housing up to current standards are not funded sufficiently to meet the goal (USAF, 2003). Because Elmendorf AFB meets the economic criteria for privatization, the sole use of MILCON funding to provide housing was eliminated from further consideration.

2.2.2 Renovate Existing Housing on Elmendorf AFB

The Air Force considered renovation of existing government-controlled MFH units to alleviate space deficiencies in the living areas. Enlarging the size of each unit to meet current living space requirements was determined to be difficult within the existing housing layout. The interior finishes, lighting, utility systems, walls, parking, and privacy fences of the units would require upgrading or replacement. The economic life of the renovated units would be extended. Annual maintenance and repair costs would be reduced. The estimated cost to perform this major renovation was determined to exceed the 70 percent threshold of the cost to construct new homes. For this reason, the alternative of renovation only for the majority of MFH units was eliminated from further consideration.

2.2.3 Construct Additional Housing on Adjacent Parcels of Land on Elmendorf AFB

Because existing housing on Elmendorf AFB is considered too dense, replacement housing would be constructed at a lower density per acre. This results in a requirement for additional developable land because it is not possible to replace existing housing units or provide the required 1,194 MFH units on the current housing footprint of land.

Land use constraints on Elmendorf AFB include noise considerations, floodplains, topographical conditions and ongoing remediation. These constraints limit the availability of suitable areas for housing. The Air Force considered construction of housing on land adjacent to existing housing areas on Elmendorf AFB. The Air Force examined a variety of sites for construction of MFH on Elmendorf AFB. While some units could be rebuilt on existing housing parcels, the availability of adjacent parcels is limited by land use constraints.

Adjacent parcels of land that could be used for housing construction would be limited to 20 acres or less. The limited size of adjacent parcels would not be adequate for design of the estimated 760 new or replacement units in a community setting. The Air Force concluded that suitable land was not available within the existing developed area of the Base. For this reason, this alternative was eliminated from further consideration.

2.2.4 Construct Housing on the North Side of Elmendorf AFB

The Air Force considered construction of new housing on the north side of Elmendorf AFB, north of the airfield. Little or no infrastructure exists on this part of the Base and road improvement would be required. Conservation areas are located on the north side of the Base. This would result in isolating new housing away from the central core of the Base. Constraints at this location included existing noise levels, proximity to antenna fields, topographical considerations and runway approach zones. For these reasons, this alternative was eliminated from further consideration.

2.3 DETAILED DESCRIPTION OF THE PROPOSED ACTION

As a solution to the need for additional, suitable land for the construction of MFH, the Air Force identified undeveloped land east of Elmendorf AFB at U.S. Army, Alaska Fort Richardson. The land on Fort Richardson meets each of the alternative selection criteria identified in Subchapter 2.1.

The Air Force proposes to use private sector financing to renovate and replace existing MFH units on Elmendorf AFB and construct additional units and an access road on undeveloped land on Fort Richardson. This action would be Phase II of the Private Sector Financed Housing program for Elmendorf AFB. Housing units in the Government Hill and Core Housing Areas on Elmendorf AFB would

be conveyed and associated land (and undeveloped parcels) would be leased to a contractor. The locations of housing areas and the adjacent Fort Richardson property are shown on Figure 2. The proposed locations of privatized housing and the new road are shown on Figure 3.

2.3.1 Renovation/Construction of MFH Units on Elmendorf AFB

The Air Force proposes to contract for the renovation, demolition and replacement of MFH units and construction of community enhancements on Elmendorf AFB. Housing units would be conveyed to a contractor who would be responsible for future renovation and construction activities. Upon completion of improvements, these units would be conveyed to a private company for long term management. Housing activity would consist of whole house renovations, minor renovations, and the replacement of existing units (demolition and construction of new units). Other units that require no renovation would also be conveyed. The Proposed Action is summarized on Table 3.

Table 3. Summary of Phase II PSF Housing for Elmendorf AFB, Proposed Action

Activity	No. of Units		
	On Elmendorf AFB	On Property to be Transferred from Fort Richardson	Total
Units to be Demolished	552	0	552
Replacement Units to be Constructed	190	570	760
Units to Receive Whole-House Renovation	36	0	36
Units to Receive Minor Renovations	274	0	274
Units Requiring No Renovation	124	0	124
Resultant Number of MFH Units	624	570	1,194

The units to be conveyed would be located within six existing MFH areas in the Government Hill Housing Area and seven areas within the Core Housing Area. The units on Elmendorf AFB proposed for renovation, demolition and new construction are described in Table 4.

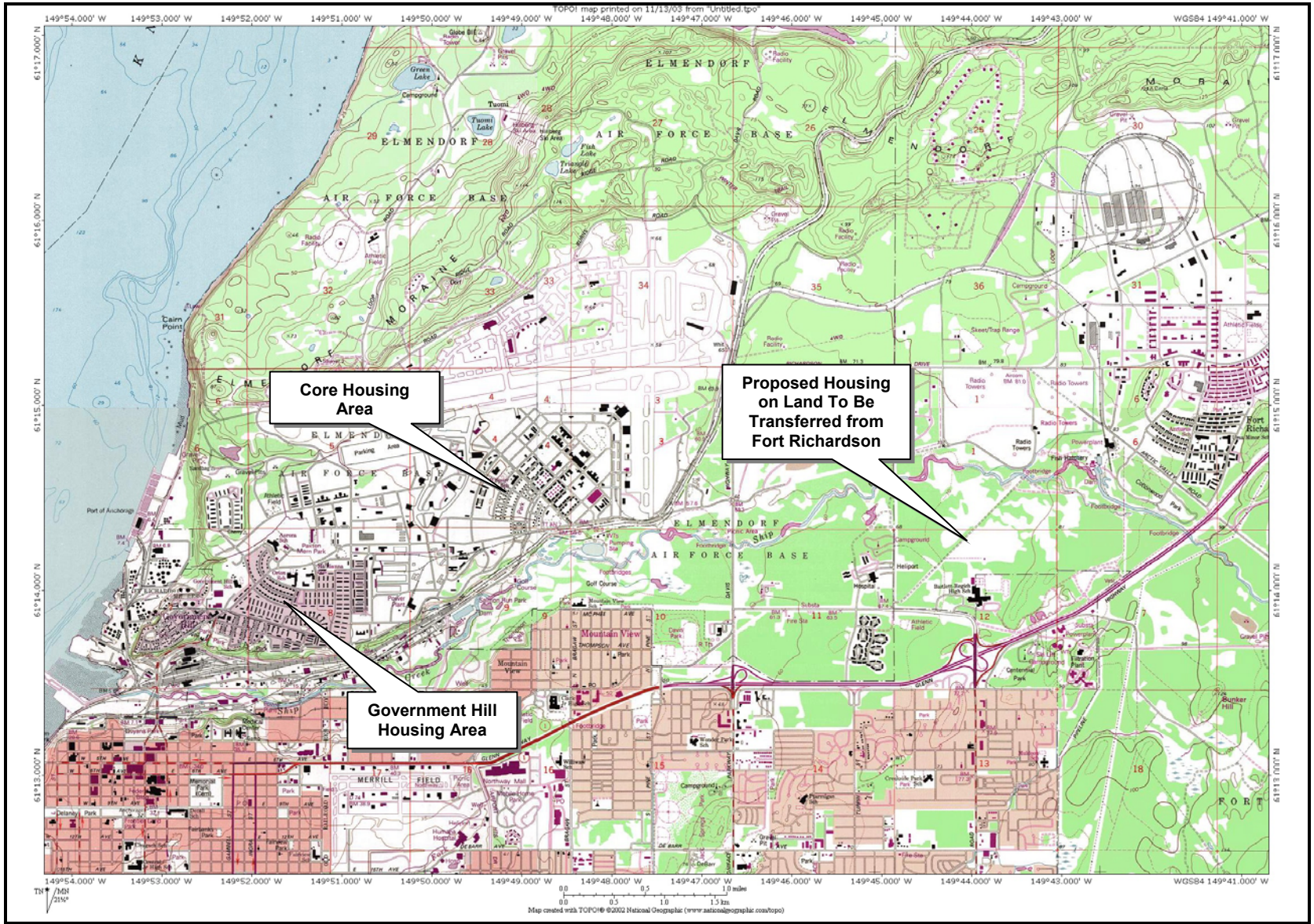
Government Hill Housing Area. The Government Hill Housing Area (western portion of the Base) is comprised of 624 MFH units and 344 previously privatized units. Housing units are located on approximately 130 acres, while approximately 45 acres are undeveloped. Areas where housing would be renovated or constructed in the Government Hill Housing Area are shown on Figure 4.

Undeveloped land adjacent to existing housing areas in the Government Hill Housing Area would be leased to a contractor. As shown on Figure 4, five parcels of land would be leased:

- At Cherry Hill, a wooded area approximately 12.7 acres in size is located on both sides of Arnold Avenue south and adjacent to the Cherry Hill MFH area. The west hillside (approximately 14.85 acres adjacent to Port of Anchorage) and the east hill (approximately 5.1 acres adjacent to the Elmendorf AFB dormitories) would also be leased to a contractor. It is not anticipated that housing units would be constructed on the 14.85 or 5.1 acres of undeveloped hillside land.

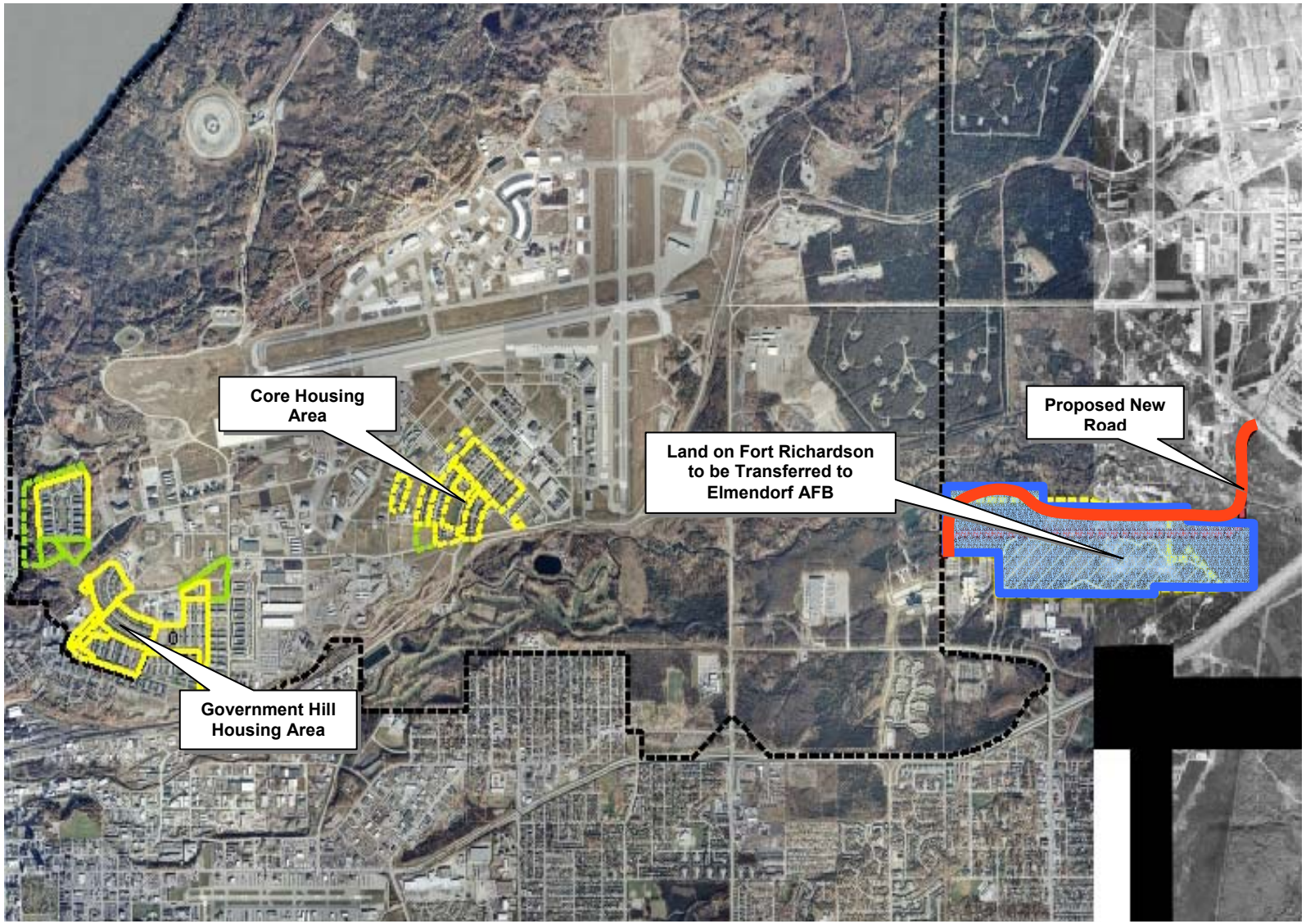
- Additional land adjacent to Boulder housing, southeast of Arctic Warrior Drive at 8th Street, is approximately 11.02 acres in size and includes the two-story Bldg 5188 (Airman's Attic/Bargain Shop) that would be demolished. The Bargain Shop has been relocated to another location on Elmendorf AFB. The remaining area on this site is open space.

Core Housing Area. The Core Housing Area (in the central portion of the Base south of the flightline) is comprised of 362 MFH units for officers and enlisted personnel. Housing units are located on approximately 65 acres, while approximately 6 acres are undeveloped. Areas where housing would be renovated or constructed in the Core Housing Area are shown on Figure 5.



Sites of Proposed Phase II PSF Housing on Elmendorf AFB and Fort Richardson

Figure 2

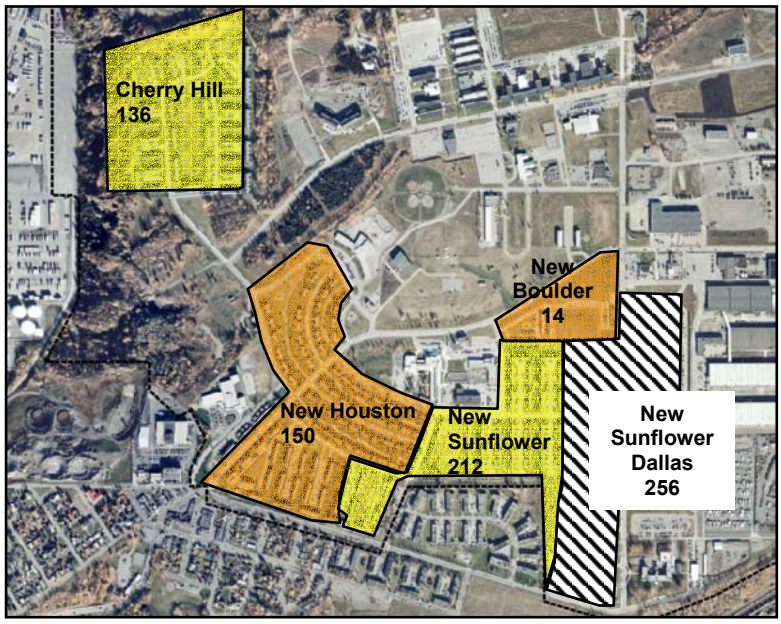


Source: USAF, 2003f

- Existing Housing Areas
- Proposed Housing Area
- Undeveloped Land on Elmendorf AFB to be Leased
- New Road to be Constructed

Aerial View of Sites of Proposed Phase II PSF Housing on Elmendorf AFB and Fort Richardson

Figure 3



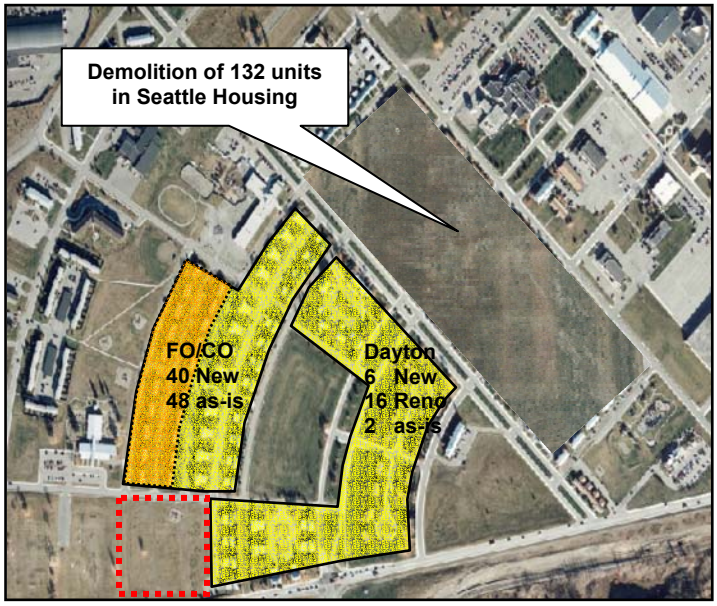
NORTH

Source: modified from USAF, 2003f

Adequate Housing
New Housing
Previously Privatized (adequate)

Government Hill Housing Area on Elmendorf AFB

Figure 4



Note: Demolition of Seattle Housing would result in vacant land to be returned to the Government. No housing would be constructed on this site.

NORTH

Source: modified from USAF, 2003f

Adequate Housing
New Housing
Land to be Leased

Core Housing Area on Elmendorf AFB
Figure 5

Table 4. Proposed Phase II PSF Housing Renovation, Demolition and Construction

MFH Area	Year Built	Existing Units	Whole-House Improvements	Units to be Demolished	Units to be Replaced or Constructed [a]	Minor Renovation	Resultant Units
Government Hill Housing Area							
Cherry Hill	1954	136	0	0	0	136	136
Douglas	1942	12	0	12	12	0	12
Boston	1949 - 53	14	0	14	14	0	14
Houston	1948	124	0	124	124	0	124
Boulder	1965	14	0	14	14	0	14
New Sunflower	1954	324	0	112	112	136	268
Core Housing Area							
GOQ Quad	1942	6	2	2	2	2	6
Dayton	1965	14	14	0	0	0	14
Boston	1949 - 53	56	0	56	56	0	56
FO/CO	1948	68	20	0	0	0	68
Denver	1965	40	0	40	40	0	40
Phoenix	1965	46	0	46	46	0	46
Seattle	1942	132	0	132	132	0	188
New Housing to Meet Deficit	--	--	--	--	208	--	208
Total		986	36	552	760	274	1,194

Source: USAF, 2003f
[a] Replacement or construction of these units would occur either on Elmendorf AFB on or property to be transferred from Fort Richardson.

One parcel of partially undeveloped land in the Core Housing Area would be leased to a contractor:

- A 5.27-acre area of undeveloped land west of the field grade officer/company grade officer (FO/CO) area, south of the Denver housing area, would be leased to a contractor and available for development of new housing units or other community facilities.

Renovation. In order to meet Air Force housing standards, many of the MFH units require enlargement of living spaces. The Proposed Action may result in conversion of existing 3-bedroom MFH units into the same number of 2-bedroom units, and the conversion of existing 4-bedroom units into the same number of 2-bedroom units. Other renovations would include conversion of basements into Arctic Recreation Space that can be used as living space during the winter months.

Demolition. The Phase II PSF project would include the demolition of 552 existing MFH units (approx. 95 acres), the recreational vehicle lot, Bldg 5188 and 51 units in the Transient Living Facilities (TLF). Existing housing units in the Douglas, Boston and Seattle housing areas would be demolished and the vacant land returned to the Government (replacement housing would not be constructed at this location). Because land returned to the Government would function as open space and be located within or adjacent to the Bird Exclusion Area (BEZ) associated with the airfield, this land would be revegetated and managed in accordance with requirements identified in the Elmendorf AFB Bird-Aircraft Strike Hazard (BASH) Plan.

An investigation to determine the presence of lead-based paint and asbestos-containing material will be conducted before demolition of buildings. Demolition of buildings that contain these materials will be conducted in accordance with applicable regulatory requirements to ensure proper handling and disposition of hazardous materials.

Existing mature trees within the housing area would be retained in place to the maximum extent practicable. Removal of mature trees would be avoided wherever possible in order to retain the aesthetic character of the housing area. It is possible that some mature trees may be removed if determined to be improperly placed (i.e., growing too close to housing units that would be renovated).

Construction of Replacement Units. Replacement units would be constructed primarily on land east of Elmendorf AFB to be transferred from Fort Richardson, and also in the same area in which most of the existing units are located, or adjacent to existing housing areas. The MFH unit design and site layout has been conceptually developed in the HCP, and would be accomplished by the selected contractor. The replacement housing will be designed to provide modern kitchen, living room, family room, bedroom and bath configurations with ample interior and exterior storage. Living units will be expanded to meet current space authorizations in accordance with current DoD and Air Force housing guidance. The housing would be designed in the same architectural style characterized by the surrounding housing area. The design of housing would incorporate architectural elements defined in the Architectural Compatibility Guidelines and Landscape Development Plan for Elmendorf AFB (USAF, 1991). The new units would be designed and constructed to comply with the Air Force noise level reduction (NLR) policy to attain interior day-night average sound levels (DNL) of 45 decibels (dBA) or less.

Transient Living Facilities. The existing Government Hill TLF includes seven 8-unit buildings (Bldgs 3040, 3058, 3060, 3062, 3064, 3066 and 3068) located along Arctic Warrior Drive on the west side of the New Sunflower MFH area. Five of these buildings have a handicapped unit that takes up the equivalent of two units. This results in a total of 51 existing units. The Proposed Action includes the demolition or relocation of 51 units in the Government Hill TLF. Existing units in the Phoenix MFH area would be demolished to provide area for a new/renovated TLF.

Community Improvements. Neighborhood enhancements would be designed to create a modern living environment. Planned enhancements include the construction of playgrounds, community centers, trails and greenways in accordance with Air Force housing standards. The replacement housing would include street modifications (if required by the layout), garages and parking areas, curbs and gutters, sidewalks, street lights, grading, surface and storm drainage, and landscaping where appropriate.

The existing street layout would be used to the maximum extent possible. New streets would be constructed in the Houston MFH area. A new street layout would be designed at the Boulder MFH area following demolition of Bldg 5188 (Airman's Attic/Bargain Shop).

The Proposed Action would include an on-base Lessee Administration Office, an on-base U-Fix-It Store, and a snow dump area. The contractor would be responsible for providing and maintaining open space, outdoor recreation areas, playgrounds and landscaping within the housing areas.

Utility System Improvements. All utility service lines (water, sewer, electricity, gas) that are dedicated to the housing areas would be conveyed to the contractor. The Air Force would retain ownership of utility lines that pass through the housing areas to serve other areas. All aboveground electrical lines servicing the housing areas would be placed underground. Heating systems would be converted from central steam to metered natural gas-fired units.

2.3.2 Construction of MFH on Fort Richardson

As part of the Proposed Action, the Army would construct housing and a new access road approximately 352 acres of undeveloped land on Fort Richardson that would be transferred to Elmendorf AFB. The land to be transferred is an active but infrequently used Army training area (Training Area 15). This site is north of Bartlett High School and the Alaska Native Heritage Center, and northeast of the DoD/Veteran's Administration (VA) Joint Venture Medical Treatment Facility (hospital) near the southeast corner of Elmendorf AFB. The 352 acres of land would be leased to a contractor who would construct approximately 570 MFH units (at a maximum density of six units per acre) over a 3 to 5 year period. Of the total acreage, it is estimated that approximately 70 percent of land would be used for housing. This property would either be surrounded by a security fencing to be constructed by the Army or be fenced and gated in accordance with standard Air Force requirements for security of housing areas. With the

exception of sewer, utility service lines (water, electricity, gas) would be tied in to the Army system. The Proposed Action would include a new sewer line to connect proposed housing units on the Fort Richardson parcel to Elmendorf AFB. Existing emergency water wells and associated facilities on this parcel would not be transferred to the Air Force. A defined area around the wells would be outgranted via easement to the Army for the purpose of wellhead protection. The Army would be responsible for physical security within the easement area. The Fort Richardson property is shown on Figure 6.

The Proposed Action would include the replacement of moose habitat that would be lost as a result of construction of housing and roads on Fort Richardson. The Air Force has developed a conceptual Moose Habitat Compensation Plan to define specific habitat replacement sites and methods. Habitat replacement would follow land/timber management practices to optimize return of moose habitat. Replacement sites will be prioritized by proximity to the affected area, enhancement potential, and long term stability of the enhanced sites by land designation that discourages future development. The quantity of replacement acreage would follow a predetermined formula based on quantity and quality of habitat lost. This formula has been agreed upon by the Fort Richardson and Elmendorf AFB biologists in consultation with the Alaska Department of Fish and Game.

In addition to housing, a new access road from Elmendorf AFB to Fort Richardson would be constructed as part of the Proposed Action. The conceptual location of the proposed road is shown on Figure 6. The road would be approximately 1.9 miles in length and approximately 60 ft wide. The proposed road would allow vehicular travel between Elmendorf AFB and Fort Richardson, and provide safe access to the housing area. The road would extend from an area at the north side of the hospital on Elmendorf AFB to Arctic Valley Road on Fort Richardson. Design of the new road from the Hospital to Arctic Valley Road will avoid, or minimize encroachment into, the riparian zone (100-year flood zone) as shown on Figure 6. The access road would include a bridge over Ship Creek. Design of the roadway would include consideration of safe passage by large wildlife species as well as human safety. Preliminary design of the roadway has been reviewed with U.S. Army Alaska (Fort Richardson) wildlife staff and the Alaska Department of Fish and Game. A subsequent NEPA evaluation of the proposed road will be prepared by the Air Force.

The Air Force has conducted an Environmental Baseline Survey (EBS) of the 352-acre parcel of land on Fort Richardson. In addition, the Army completed an Environmental Condition of Property (ECOP) for this land in early 2004. The findings of these studies have been summarized in this EA.

2.3.3 Construction Activities

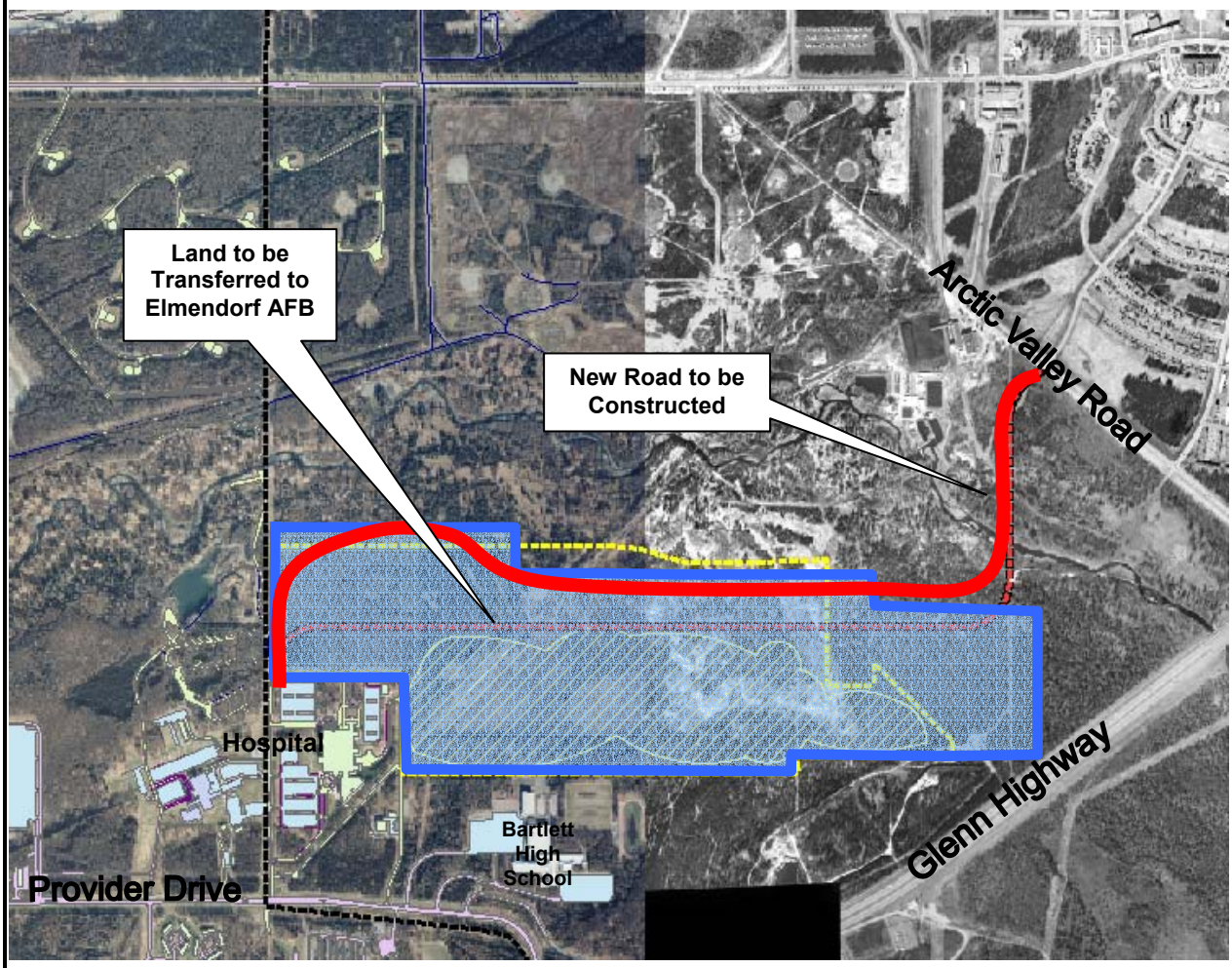
It is anticipated that the Phase II PSF housing project would begin with the construction of new housing followed by renovation of existing MFH units. This approach would result in the ability to provide on-base housing for families that would be required to vacate for planned renovations or replacements.

The contractor would identify the required permits and ensure the permits are obtained from the applicable base, local, state, or federal agency. It is estimated that the construction and renovations of housing on Elmendorf AFB, including housing that would be constructed on land acquired from Fort Richardson, would occur over a period of three to five years.

2.3.4 Occupancy of Phase II PSF Housing

The leasing of MFH units and property management services would be contracted to a private company. The 986 Phase II PSF housing units on Elmendorf AFB provide housing for approximately 3,944 persons based on an average family size of four. It is projected that families that would be required to vacate these units for the planned renovation, demolition and construction would be housed in other on-base MFH units, whenever possible. The Air Force is currently in the process of renovating MFH units, which would become available to military personnel. It is anticipated that some families may be required to reside in temporary housing in the local community until replacement housing is available on the Base.

The Phase II PSF contractor would provide tenants with rental insurance with each lease, and provide the Air Force with a schedule for future renovation of all units based on the age since last renovation.



NORTH

Source: modified from USAF, 2003f

Undeveloped Land to be Leased
Road to be Constructed
Boundary of Elmendorf AFB

Proposed Housing and New Road on Fort Richardson Land to be Transferred to Elmendorf AFB

Figure 6

While it is anticipated that Phase II PSF housing would be fully occupied by military personnel, units may be rented to other eligible tenants under certain conditions. Only when vacancies have exceeded five percent for more than three consecutive months, units can be rented to eligible tenants at market rent. Only that number of vacant units can be filled to bring the vacancy rate to five percent. Units shall be rented through the use of a priority list (in descending order) as follows: other than referred active duty Air Force member, other active duty member, federal Civil Service employee, military retiree, Military Reserve and Guard member, military veteran, and the general public.

2.4 DESCRIPTION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, no new MFH units would be constructed on Elmendorf AFB using private sector funding. Military personnel and dependents would continue to reside in the existing 986 units on Elmendorf AFB, and land would not be transferred from Fort Richardson. The No Action Alternative would not fulfill the need for the Air Force to provide suitable housing for its military members. Renovations would continue to occur subject to availability of MILCON funding. The No Action Alternative, or maintaining the status quo, is not desirable because many units are deteriorating and do not meet Air Force housing standards or current building codes.

2.5 DESCRIPTION OF THE ALTERNATIVE ACTION

Further study on the condition of individual MFH units may reveal that renovation may be feasible for a greater number of units than described for the Proposed Action. The condition of individual units would not be known until the selected contractor conducts individual housing inspections. For this reason, the Air Force is also considering the alternative of renovating more existing units than the Proposed Action. The Alternative Action would result in the use of private sector financing to renovate 680 units, and construct 190 replacement units on Elmendorf AFB and 200 new MFH units on property to be transferred from Fort Richardson (Table 5). Demolition of 182 existing units would be required. All other aspects of the Alternative Action would be the same as the Proposed Action.

Table 5. Summary of Phase II PSF Housing at Elmendorf AFB, Alternative Action

	On Elmendorf AFB	On Property to be Transferred from Fort Richardson	Total
Units to be Demolished	182	0	182
Replacement Units to be Constructed	190	200	390
Units to Receive Whole-House Renovation	406	0	406
Units to Receive Minor Renovations	274	0	274
Units Requiring No Renovation	124	0	124
Resultant Number of MFH Units	994	200	1,194

2.6 OTHER ACTIONS ANNOUNCED FOR THE PROJECT AREA

A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The Air Force has announced other projects for Elmendorf AFB that could occur during the same time period as the Proposed Action as described on Table 6. Planned projects that would occur at Elmendorf AFB during the same time as the Proposed Action include construction associated with the proposed beddown of C-17 aircraft.

Table 6. Other Actions Announced for the Project Area

Construction Project	Year
Elmendorf AFB[a]	
Security Fencing	2003
Landfill Cap	2004
Hillberg Horse Stable Relocation	2004
Add/Alter Fitness Center	2005
C-17 Utilities and Simulator Facility	2005
F-15E Simulator	2005
C-17 Maintenance Complex and Hangar 18 Alterations	2006
Add/Alter Survival Equipment Shop	2006
Large Airframe Maintenance Hangar	2006
New Avionics Shop	2006
New Professional Military Education Center	2006
Entomology Shop	2006
C-17 Fuel Cell Nose Dock	2007
Segregated Magazine Storage	2007
Aircraft Parking Ramp (East Side Development Program)	2007
Automated Vehicle Wash Facility	2007
Replacement of Dormitories	2007
Privatization of Utilities (under study)	TBD
Energy Savings Performance Contracts (ESPC) Construction	TBD
Anchorage Area	
Alaska Railroad Corporation Track Realignment (along south bluff near Post Road Gate)	TBD
Port of Anchorage	
Knik Arm Crossing	TBD
Intermodal Expansion Program	TBD
Fort Richardson	
Security Fencing	2004
Transformation of 172nd Infantry Brigade to Stryker Brigade Combat Team	TBD

Source: USAF, 2001a
[a] DOD/VA Hospital was constructed in 2002

Directly south of Elmendorf AFB, the Alaska Railroad Corporation is proposing to realign railroad tracks near the Post Road Gate. To the west of Elmendorf AFB, the State of Alaska (Knik Arm Bridge and Toll Authority) is proposing to construct a bridge that would span the Cook Inlet from the Port of Anchorage to Point McKenzie. The Port of Anchorage is proposing an Intermodal Expansion Program to include road and rail improvements, construction of the north terminal, and dock expansion west of the Base.

On Fort Richardson, the Army has proposed to construct security fencing along 34 miles of the installation boundary (a Draft EA was released for public review in August 2003). The Army is proposing to transform the 172nd Infantry Brigade (Separate) to a Stryker Brigade Combat Team with changes to force structure, ranges, facilities and infrastructure on Fort Wainwright, Fort Richardson and outlying training areas (a Draft EIS was released in July 2003). These projects are assessed from a cumulative perspective in this EA.

2.7 COMPARISON OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Tables 7 and 8 summarize the impacts of the Proposed Action, Alternative Action and No Action Alternative at Elmendorf AFB and Fort Richardson, respectively.

2.8 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The preferred alternative is to implement the Proposed Action as described in Subchapter 2.3.

2.9 MITIGATION REQUIREMENTS

With the exception of a Moose Habitat Compensation Plan that would be prepared and implemented by the Air Force, mitigation measures would not be required for the Proposed or Alternative Action.

Project design and management would incorporate specific design features and best management practices that would prevent and/or minimize the potential for environmental impacts. The Proposed Action would include moose habitat replacement and enhancement to compensate for loss of habitat (and reduce potential moose-human conflicts) that would result from construction of MFH units on property to be transferred from Fort Richardson. Solid waste management practices as outlined in Best Management Practices (Table 10) are expected to minimize bear-human conflicts that would be created by locating high density housing in bear habitat and adjacent to a bear travel corridor. Design and management practices are detailed in Chapter 4, Environmental Consequences, and summarized in Tables 9 and 10.

Table 7. Summary of Environmental Impacts for Elmendorf AFB

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Mission (Subchapter 4.1)	The Proposed Action would not impact the ability of the Air Force to meet the mission of Elmendorf AFB.	No change from the baseline condition as described in Subchapter 4.1.
Noise (Subchapter 4.2)	Noise impacts from replacement and construction of housing at Elmendorf AFB would be limited to short-term, localized increases in noise levels directly associated with the use of demolition and construction equipment. After units are constructed, the noise environment would be similar to baseline conditions. These effects would not be considered significant impacts to the noise environment.	No change from the baseline condition as described in Subchapter 3.2.
Land Use (Subchapter 4.3)	The Proposed Action would result in the conversion of approximately 29 acres of open space into housing. The undeveloped land proposed for new housing would be entirely within the developed Main Cantonment Area of the Base. The Proposed Action would not result in any adverse effects on existing sensitive land use nor would it interfere with the activities or functions of adjacent existing or proposed land uses. Impacts to land use would not be considered significant.	No change from the baseline condition as described in Subchapter 3.3.
Air Quality (Subchapter 4.4)	***Proposed Action:*** Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during demolition and construction. Air pollutant emissions would be short-term and localized, and would not result in any adverse effects on overall ambient air quality. Demolition would include removal of asbestos and lead-based paint, and this activity would be conducted in accordance with applicable environmental requirements for the safe removal and disposal of these materials. Construction activities associated with the Proposed Action would result in particulate matter emissions that represent less than 0.4 percent of the inventory of emissions for Air Quality Control Region (AQCR) No. 8. This region is in attainment, and therefore, a conformity determination would not be required. Emissions from occupancy of the additional 208 MFH units on Elmendorf AFB would represent an increase in baseline air pollutant emissions from heating sources and vehicular emissions. Additional emission sources will be incorporated into the planning inventory of Base emissions in accordance with air quality permitting requirements. Because no new personnel authorizations are anticipated for Elmendorf AFB, emissions associated with occupancy of the proposed MFH units would not result in a substantial change to baseline emissions of air pollutants in AQCR No. 8. Therefore, the air quality impacts from the Proposed Action would not be considered significant. ***Alternative Action:*** Air pollutant emissions of CO, VOC, NOx, and SOx during construction would be the less than the Proposed Action. Construction activities associated with the Alternative Action would result in particulate matter emissions that represent less than 0.3 percent of the inventory of emissions for AQCR No. 8. Impacts to air quality would not be considered significant.	No change from the baseline condition as described in Subchapter 3.4.
Water Resources (Subchapter 4.5)	The construction of housing at Elmendorf AFB would not result in adverse effects to surface or groundwater quality or quantity. The Proposed Action would be designed and constructed with standard erosion control measures that would be incorporated into project planning.	No change from the baseline condition as described in Subchapter 3.5.

Table 7. Summary of Environmental Impacts for Elmendorf AFB (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Hazardous Materials and Wastes (Subchapter 4.6)	With compliance with hazardous materials management procedures, significant impacts from hazardous materials would not be anticipated. Demolition of the existing housing would result in the generation of hazardous waste, particularly building materials with asbestos and LBP. These demolition wastes will be managed in accordance with AFI 32-4-7042. The volume of chemicals procured for housing construction would not be expected to impact the ability of the Base to meet its reduction goals. The generation of hazardous waste would increase slightly during the demolition and construction. However, these increases would be temporary and would not impact the Base's attainment of the hazardous waste reduction goals. The demolition contractor would be responsible for all asbestos removal before actual demolition of the building. All friable asbestos will be removed by a licensed asbestos abatement contractor using approved abatement methods. The Air Force would ensure that the presence of any lead-based paint is identified before initiating demolition. Removal of lead-based paint shall comply with 29 CFR 1910. The Proposed Action would not be expected to result in interference with ongoing remediation or investigation activities at Elmendorf AFB. Herbicide and pesticide contamination of the housing sites are not suspected as these sites were not used for agricultural purposes. Radon levels above the RAL would not be expected in the MFH areas. The Proposed Action would not be expected to result in any impacts from radon. All polychlorinated biphenyl (PCB) removal would be conducted in accordance with approved methods. The Proposed Action would not be expected to result in any impacts from PCB.	No change from the baseline condition as described in Subchapter 3.6.
Biological Resources (Subchapter 4.7)	Housing areas on Elmendorf AFB are in an area of the Base that was previously disturbed and does not provide significant habitat for native species of plants or animals. The Proposed Action would not result in any impacts to threatened or endangered species, because no federally listed species are known to exist on Elmendorf AFB. The Proposed Action would not affect any species of special interest. The Proposed Action would not be expected to substantially diminish a regionally or locally important plant or animal species. The Proposed Action would not be expected to result in a substantial infusion of exotic plant or animal species. The sites for construction of new housing are not located in any wetlands or floodplains.	No change from the baseline condition as described in Subchapter 3.7.
Cultural Resources (Subchapter 4.8)	Ten structures in the GOQ Quad are eligible for listing on the NRHP. The Air Force would ensure that these properties are evaluated for historical significance in accordance with NHPA Section 106, and that any modifications or demolition of such structures is conducted in compliance with the Draft Programmatic Agreement.	No change from the baseline condition as described in Subchapter 3.8.

Table 7. Summary of Environmental Impacts for Elmendorf AFB (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Cultural Resources (Subchapter 4.8) – Cont'd	The Proposed Action would involve ground-disturbance during demolition and construction, and may result in the inadvertent discovery of subsurface cultural materials. Damage to, or loss of any cultural artifacts would be considered a significant impact. To avoid this impact, the Air Force will ensure that procedures for emergency discovery of cultural material are followed. The Proposed Action would not be located in any area that is in use by a federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action.	
Geological Resources (Subchapter 4.9)	Construction at Elmendorf AFB would occur within an area where the physiographic features and geologic resources have been previously disturbed and modified by prior construction of military family housing. Alteration of ground surface would be minimal compared to existing conditions. Therefore, impacts to physiography and geology would be minimal. Construction would occur within an area in which the soils have been disturbed and modified by prior housing construction. Earthwork at these locations and at the undeveloped sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Installation of best management practices would minimize erosion during demolition and construction. Best management practices for backfilling and use of borrow pits would also be incorporated into project plans. Therefore, adverse effects to soils would be minimal.	No change from the baseline condition as described in Subchapter 3.9.
Infrastructure and Utilities (Subchapter 4.10)	The replacement of existing housing on Elmendorf AFB would not result in any increase in water consumption, wastewater treatment requirements, solid waste generation, natural gas use, or electricity needs. The housing would be designed with adequate storm water management facilities. Impacts to infrastructure and utilities would not be considered significant.	No change from the baseline condition as described in Subchapter 3.10.
Transportation (Subchapter 4.11)	The Proposed Action would result in temporary and localized traffic increases at housing construction areas on Elmendorf AFB. No change to existing traffic patterns or volumes would result on Elmendorf AFB because existing roadways would be used and no net change in the number of MFH units on the Base would result.	No change from the baseline condition as described in Subchapter 3.11.
Public Services (Subchapter 4.12)	It is expected that police protection services would continue to be provided by Base Security. The Proposed Action would not result in any significant impact on the ability of the Anchorage Police Department to provide protection services within its service area. It is expected that fire protection services would continue to be provided by the Elmendorf AFB Fire Department. The Proposed Action would not result in any significant impact on the ability of the Anchorage Fire Department to provide fire protection services within its service area. The Proposed Action would not be expected to result in any significant impact on the ability of the local medical facilities to provide medical services in the area.	No change from the baseline condition as described in Subchapter 3.12.
Safety (Subchapter 4.13)	The Proposed Action would not result in any increase in the safety risk because housing would continue to be located in existing locations on Elmendorf AFB.	No change from baseline conditions described in Subchapter 3.13.

[1] Impacts of the Alternative Action would be the same as the Proposed Action, except as noted.

Table 8. Summary of Environmental Impacts for Fort Richardson

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Mission (Subchapter 4.1)	The Proposed Action would not impact the ability of the Air Force to meet the mission of Fort Richardson.	No change from the baseline condition as described in Subchapter 3.1.
Noise (Subchapter 4.2)	Noise impacts from construction of housing on Fort Richardson property to be transferred to Elmendorf AFB would result in short-term, localized increases in noise levels directly associated with the use of construction equipment. After units are constructed, the noise environment would experience noise levels higher than baseline conditions. The resultant noise level would not be expected to exceed the Air Force criteria of DNL 75 dBA. These effects would not be considered significant impacts to the noise environment.	No change from the baseline condition as described in Subchapter 3.2.
Land Use (Subchapter 4.3)	The Proposed Action would result in the conversion of up to approximately 352 acres of open space into housing. This change in land use would be consistent with the future land use designation for this site. The Proposed Action would result in discontinuation of the informal use of the site for recreation by Bartlett High School. The trail south of the property line would remain intact. Impacts to land use would not be considered significant.	No change from the baseline condition as described in Subchapter 3.3.
Air Quality (Subchapter 4.4)	***Proposed Action:*** Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during demolition and construction. Air pollutant emissions would be short-term and localized, and would not result in any adverse effects on overall ambient air quality. Construction activities associated with the Proposed Action would result in particulate matter emissions that represent less than 0.4 percent of the inventory of emissions for AQCR No. 8. This region is in attainment, and therefore, a conformity determination would not be required. Emissions from occupancy of the additional 208 MFH units on Elmendorf AFB would represent an increase in baseline air pollutant emissions from heating sources and vehicular emissions. Additional emission sources will be incorporated into the planning inventory of Base emissions in accordance with air quality permitting requirements. Because no new personnel authorizations are anticipated for Elmendorf AFB, emissions associated with occupancy of the proposed MFH units would not result in a substantial change to baseline emissions of air pollutants in AQCR No. 8. Therefore, the air quality impacts from the Proposed Action would not be considered significant. ***Alternative Action:*** Air pollutant emissions of CO, VOC, NOx, and SOx during construction would be the less than the Proposed Action. Construction activities associated with the Alternative Action would result in particulate matter emissions that represent less than 0.3 percent of the inventory of emissions for AQCR No. 8. Impacts to air quality would not be considered significant.	No change from the baseline condition as described in Subchapter 3.4.
Water Resources (Subchapter 4.5)	Construction of housing and associated community facilities on the Fort Richardson property would be accomplished using standard erosion control practices. The construction of housing at Fort Richardson would not result in adverse effects to surface or groundwater quality or quantity.	No change from the baseline condition as described in Subchapter 3.5.

Table 8. Summary of Environmental Impacts for Fort Richardson (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Hazardous Materials and Wastes (Subchapter 4.6)	Construction of housing would avoid standby water wells on or near the property to be transferred. The new sewer line to be constructed for housing would be sited outside a protective zone around the wells. The Air Force would ensure that wells and associated protection areas are protected in accordance with applicable regulations. The Air Force and the Army will work together to determine appropriate requirements and management for wellhead protection areas on the property to be transferred. Impacts to groundwater on Fort Richardson would not be expected to occur. Construction of housing on Fort Richardson would result in a temporary increase in the generation of hazardous waste. These wastes will be managed in accordance with the Elmendorf AFB Hazardous Waste Management Plan. The volume of chemicals procured for housing construction would not be expected to impact the ability of the Base to meet its reduction goals. With compliance with hazardous materials management procedures, significant impacts from hazardous materials would not be anticipated. The Proposed Action would not be expected to result in interference with ongoing remediation or investigation activities on Fort Richardson. Herbicide and pesticide contamination of the housing site is not suspected as the site was not used for agricultural purposes. The Air Force would ensure that applicable design criteria for reduction of radon in new construction is followed. The Proposed Action would not be expected to result in any impacts from radon. All PCB removal would be conducted in accordance with approved methods. The Proposed Action would not be expected to result in any impacts from PCB.	No change from the baseline condition as described in Subchapter 3.6.
Biological Resources (Subchapter 4.7)	The construction of new housing on Fort Richardson would result in the loss of up to 352 acres of winter range habitat for moose. The Proposed Action would include enhancement of a currently barren landfill and surrounding area to provide future high quality moose habitat. Additional acres of moose habitat enhancement would be specified by location, acreage and treatment technique in response to a predetermined habitat replacement formula. The Air Force will work with agencies to determine the appropriate reduction in moose population that can be sustained on reduced availability of winter habitat. The design of the proposed road and bridge would include consideration of large wildlife passage and human safety in coordination with the U.S. Army and the Alaska Department of Fish and Game. Much of the 352 acres is bear (primarily black bear) habitat. The adjacent Ship Creek riparian zone also serves as a travel corridor for both species of bears. The proximity of human development to bear habitat typically creates a risk for bear-human conflicts. The sites for construction of new housing are not located in any wetlands or floodplains. Design of the proposed road would avoid or minimize encroachment into the riparian zone associated with Ship Creek. The Proposed Action would not significantly affect threatened or endangered species, because no federally listed species are known to exist on Fort Richardson.	No change from the baseline condition as described in Subchapter 3.7.

Table 8. Summary of Environmental Impacts for Fort Richardson (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Cultural Resources (Subchapter 4.8)	The Proposed Action would not be located in or near NRHP-listed historic properties on Fort Richardson. The Air Force would ensure that existing structures on the property to be transferred are evaluated for historical significance. The Proposed Action would involve ground-disturbance during site preparation and construction, and may result in inadvertent discovery of subsurface cultural materials. Damage to, or loss of any cultural artifacts would be considered a significant impact. To avoid this impact, the Air Force will ensure that procedures for emergency discovery of cultural material are followed. The Proposed Action would not be located in any area that is in use by a federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action.	No change from the baseline condition as described in Subchapter 3.8.
Geological Resources (Subchapter 4.9)	Construction at Fort Richardson would occur within an area where the physiographic features and geologic resources have not been previously disturbed and modified by prior construction of military family housing. Alteration of ground surfaces for housing and roads would be limited to excavation to shallow depths, clearing and grading. Therefore, impacts to physiography and geology would not be considered significant. Earthwork at the undeveloped site would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Best management practices to minimize erosion during construction would be included in project planning. Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion. Therefore, adverse effects to soils would be minimal.	No change from the baseline condition as described in Subchapter 3.9.
Infrastructure and Utilities (Subchapter 4.10)	The placement of up to 208 new housing units on Fort Richardson property would result in an increase in water consumption. This would not be expected to affect the ability of the water supply system at Fort Richardson to provide potable and domestic water. The increase in wastewater generation from the additional 208 housing units would not be expected to result in any significant impact on the Municipality of Anchorage treatment plant. Although the wastewater treatment system is adequate to meet future needs, the Air Force would ensure that best management practices are carried out to provide adequate wastewater treatment in the future. The proposed housing would be designed and constructed with adequate storm water systems. Impacts to storm water management would not be expected from the Proposed Action. This increased consumption of natural gas by the additional housing units would not be expected to result in any significant impact to the local service provider. The solid waste generated from construction activities would result in construction debris being disposed in the Anchorage Regional Landfill. The local landfill has sufficient capacity to accommodate disposal needs for future years. For this reason, the Proposed Action would not result in any impact to solid waste management.	No change from the baseline condition as described in Subchapter 3.10.

Table 8. Summary of Environmental Impacts for Fort Richardson (Cont'd)

Resource (Applicable Subchapter)	Proposed Action[1]	No Action Alternative
Transportation (Subchapter 4.11)	The Proposed Action would result in temporary and localized traffic increases during the construction phase. Housing would be designed with adequate access via a new road connecting Elmendorf AFB to Arctic Valley Road. The Air Force would coordinate design and construction of the road with Municipality of Anchorage Planning, Development and Public Works and the U.S. Department of Transportation (Federal Highway Administration) to ensure that Glenn Highway can accommodate future traffic flows on roadways, intersections and ramps.	No change from the baseline condition as described in Subchapter 3.11.
Public Services (Subchapter 4.12)	It is expected that police protection services would be provided by Base Security. The Proposed Action would not result in any significant impact on the ability of the Anchorage Police Department to provide protection services within its service area. It is expected that fire protection services would be provided by the Elmendorf AFB Fire Department. The Proposed Action would not result in any significant impact on the ability of the Anchorage Fire Department to provide fire protection services within its service area. The Proposed Action would not be expected to result in any significant impact on the ability of the local medical facilities to provide medical services in the area.	No change from the baseline condition as described in Subchapter 3.12.
Safety (Subchapter 4.13)	The proposed housing on Fort Richardson would be located in proximity to antenna fields and ammunition storage areas. The antenna field north of the site has directional antennas that emit signals away from the proposed site. A health hazard associated with EMF has not been established to exist. Therefore, EMF is not considered to be a safety risk to the proposed housing. The proposed housing area on Fort Richardson would be located within one mile of ammunition storage areas. Ammunition areas are managed by the Army in accordance with DoD safety standards for ordnance storage. These standards are designed to provide protection against serious injury, loss of life and damage to property. Housing would not be sited within any explosive safety arcs as defined by DoD guidance. The ammunition storage areas are not considered to be a safety risk to the proposed housing area.	No change from the baseline condition as described in Subchapter 3.13.

[1] Impacts of the Alternative Action would be the same as the Proposed Action, except as noted.

Table 9. Summary of Best Management Practices for Elmendorf AFB

Resource	Best Management Practices
Noise	▪ Design and construction of the replacement housing units to comply with the Air Force noise level reduction policy to attain interior noise levels of DNL 45 dBA. ▪ Development of a housing vacancy plan that would keep occupied units as far away as possible from planned construction activity.
Land Use	Proposed changes in land use as a result of the construction of new MFH will be included in the update to the General Plan for Elmendorf AFB.
Air Quality	Watering the disturbed areas of the construction site would reduce total suspended particulate emissions as much as 50 percent.
Water Resources	▪ Design and construction of the replacement housing units to incorporate adequate storm drainage. ▪ Compliance with provisions of the MSGP, SWPPP and BMPs to prevent or minimize the potential for impacts to water resources. ▪ Include erosion control measures for all ground-disturbing construction activities. Comply with standard erosion control practices for ground disturbing activities. ▪ Consult with the Alaska Department of Environmental Conservation, Division of Air and Water Quality, Watershed Management Section, to determine whether a wastewater disposal permit will be required during planned construction activities. ▪ Conduct earthwork to minimize the duration of exposure of unprotected soils. ▪ Establish single point construction entries to minimize erosion during demolition and construction. ▪ Reestablish grass and other landscaping in disturbed areas immediately after construction is completed.
Hazardous Materials and Wastes	▪ Work shall be managed in accordance with the *Elmendorf AFB Oil Discharge Prevention and Contingency Plan* (CPlan). The contractor shall be required to immediately call 552-SPIL if a hazardous substance or petroleum product is released or, if excavation activities encounter contaminated soil, tanks, or debris. ▪ In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor will take immediate action to contain and clean up the spill. ▪ Contractor spill clean up personnel will be trained and certified to perform spill clean up. ▪ The contractor will be responsible for the proper characterization and disposal of any waste and clean up materials generated. ▪ All waste and associated clean up material will be removed from the Base and transported and/or stored in accordance with regulations until final disposal. ▪ All details concerning the spill will be provided to the Air Force in the form of a written incident report. ▪ The contractor is responsible for restoring a spill site to the condition prior to the spill or to an improved condition. ▪ Fueling and lubrication of equipment will be conducted in a manner that affords maximum protection against spills. ▪ Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons and is recommended for smaller tanks. ▪ The Air Force will ensure that coordination with the ERP Office is conducted before any demolition or construction work is initiated. The Air Force will ensure that demolition and construction activities at each MFH area are coordinated with ongoing remediation or investigation activities at any CERCLA or SERA sites. ▪ The Air Force will ensure that any applicable land use controls are followed as described in Subchapter 3.6.6. ▪ In the event that excavation encounters groundwater, sampling for contaminants will be required. Contractor supervision by 3 CES/CEVR will be provided for all excavation work above known contaminant plumes. ▪ The Air Force will ensure that a proper Base Civil Engineer (BCE) Work Clearance Request is processed and routed through 3 CES/CEV for each construction area in accordance with 3rd Wing Instruction 32-1007 (12 July 2001).

Table 9. Summary of Best Management Practices for Elmendorf AFB (Cont'd)

Resource	Best Management Practices
Biological Resources	▪ The Air Force will require that all housing areas be managed to avoid attracting bears and moose. ▪ The Air Force will require that all garbage receptacles outside the home in housing areas be bear-proof. ▪ To minimize the potential for human-moose conflicts, landscaping for the housing areas will specify shrubs and plants that are low in moose palatability, and are in accordance with species approved in the Base landscape plan. ▪ Open areas created by removal of housing structures and not identified as lawn, parade field or playground would be revegetated in accordance with BASH vegetation management procedures. ▪ Base residents will frequently be made aware of the potential for conflicts with moose, bears and other wildlife.
Cultural Resources	▪ The Air Force will conduct National Historic Preservation Act (NHPA) Section 106 consultation to include an evaluation of the eligibility of the ten units in the Generals' Quad Residential District for inclusion on the NRHP. If eligible, an assessment of effect will be made. If adverse effects are found, then a Memorandum of Agreement will be developed to mitigate adverse effects. ▪ The Air Force will require that any renovations, rehabilitation, additions and/or modifications to housing units or structures in the Generals' Quad Residential District are conducted in compliance with Stipulation IV of the Draft Programmatic Agreement (Attachment 5.4 of the ICRMP). This shall include design of such renovations to conform to the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67), submittal of preliminary (35 percent) design information to the Alaska Office of History and Archeology (OHA), and compliance with 36 CFR Part 800, as required. ▪ The Air Force will require that any demolition of housing units or structures in the Generals' Quad Residential District are conducted in compliance with Stipulation V of the Draft Programmatic Agreement (Attachment 5.4 of the ICRMP). This shall include photodocumentation, recordation, and compliance with 36 CFR Part 800, as required. ▪ In the event any previously undetected archaeological resources are discovered during earthwork, the construction contractor will be required to stop construction activities in the affected area and contact the Elmendorf AFB Cultural Resources Manager (CRM) or designate. The CRM will follow the procedures in Section 4.5.1 (Inadvertent Discovery of Archaeological Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties. ▪ In the event that any Alaska Native human remains are encountered during construction, excavation will stop and the Elmendorf AFB Cultural Resources Manager will be notified immediately. The CRM will follow the procedures in Section 4.5.2 (Discovery of Human Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups.
Geological Resources	▪ The Air Force would ensure that specific recommendations included in the geotechnical investigation for the MFH areas are followed to the maximum extent practicable. ▪ Best management practices identified for Water Resources would ensure that potential impacts to geologic resources and excessive erosion are avoided or minimized. ▪ All backfill material would be obtained from existing pits on Elmendorf AFB (no new pits would be opened or otherwise required as a result of the Proposed Action). ▪ The Air Force would also ensure that a separate reclamation plan is prepared for the State of Alaska for any excavation of graven in any pit that exceeds 50,000 cubic yards per year. ▪ No metal, wood, demolition rubble or other material shall be placed in any borrow pits (concrete rubble is allowable). ▪ In the event any other material is placed in a borrow pit, the contractor would be required to remove this material and dispose of the material off-base. ▪ Excavated material from MFH construction sites would be used to backfill borrow pits wherever possible.

Table 9. Summary of Best Management Practices for Elmendorf AFB (Cont'd)

Resource	Best Management Practices
Infrastructure and Utilities	▪ The Air Force would consider long-term improvements to the wastewater treatment system associated with Base development and growth. ▪ The Air Force would perform routine analyses to detect leaks, infiltration or system failure. ▪ The Air Force would continue to promote best management practices to prevent roadway and facility deterioration that could result from improper storm water drainage. ▪ The Air Force would identify areas essential to the management of snow removal and storm water drainage systems, and preserve such areas, in planning for Base development and growth. ▪ The new housing units would include energy conservation techniques and energy efficient equipment to achieve reductions in natural gas consumption. This energy consumption reduction would enhance the ability of Elmendorf AFB to achieve the reduction goals specified in AFI 32-7080. ▪ The Air Force will continue its study of power alternatives to identify options for providing adequate electrical power for the future. ▪ The Air Force would ensure that debris and construction wastes are recycled to the maximum extent possible. ▪ The Air Force will require that the housing area be managed to avoid attracting bears and moose. Outdoor solid waste receptacles in the housing areas will be bear-proof.
Transportation	(None)
Public Services	The Air Force would coordinate any future proposed changes in public services needs with the appropriate local police and fire protection agencies as well as emergency medical service providers.
Safety	(None)

Table 10. Summary of Best Management Practices for Fort Richardson

Resource	Best Management Practices
Noise	▪ Design and construction of the replacement housing units to comply with the Air Force noise level reduction policy to attain interior noise levels of DNL 45 dBA. ▪ Development of a housing vacancy plan that would keep occupied units as far away as possible from planned construction activity.
Land Use	▪ The Air Force will coordinate access issues for Bartlett High School with the Anchorage School District.
Air Quality	Watering the disturbed areas of the construction site would reduce total suspended particulate emissions as much as 50 percent.
Water Resources	▪ Design and construction of the housing units to incorporate adequate storm drainage. ▪ Compliance with provisions of the MSGP, SWPPP and BMPs to prevent or minimize the potential for impacts to water resources. ▪ Include erosion control measures for all ground-disturbing construction activities. Comply with standard erosion control practices for ground disturbing activities. ▪ Consult with the Alaska Department of Environmental Conservation, Division of Air and Water Quality, Watershed Management Section, to determine whether a wastewater disposal permit will be required during planned construction activities. ▪ Conduct earthwork to minimize the duration of exposure of unprotected soils. ▪ Establish single point construction entries to minimize erosion during demolition and construction. ▪ Reestablish grass and other landscaping in disturbed areas immediately after construction is completed. ▪ Construction of housing would avoid standby water wells on or near the property to be transferred. ▪ The new sewer line to be constructed for housing would be sited outside a defined protection area around the wells. ▪ The Air Force would ensure that wells and associated protection areas are protected in accordance with applicable regulations. The Air Force and the Army will work together to determine appropriate requirements and management for wellhead protection areas on the property to be transferred ▪ Construction work in and near Ship Creek would be conducted in accordance with permit stipulations in the Army Corp of Engineers Section 404 permit.
Hazardous Materials and Wastes	▪ In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor will take immediate action to contain and clean up the spill. ▪ Contractor spill clean up personnel will be trained and certified to perform spill clean up. ▪ The contractor will be responsible for the proper characterization and disposal of any waste and clean up materials generated. ▪ All waste and associated clean up material will be removed from the Base and transported and/or stored in accordance with regulations until final disposal. ▪ All details concerning the spill will be provided to the Air Force in a written incident report. ▪ The contractor is responsible for restoring a spill site to the condition prior to the spill or to an improved condition. ▪ Fueling and lubrication of equipment will be conducted in a manner that affords maximum protection against spills. ▪ Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons and is recommended for smaller tanks. ▪ The Air Force will ensure that coordination with the U.S. Army Remediation Office is conducted before any demolition or construction work is initiated. The Air Force will ensure that demolition and construction activities at each MFH area are coordinated with ongoing remediation or investigation activities at any CERCLA or SERA sites. ▪ In the event that excavation encounters groundwater, sampling for contaminants is conducted. Contractor supervision by 3 CES/CEVR will be provided for all excavation work above known contaminant plumes.

Table 10. Summary of Best Management Practices for Fort Richardson (Cont'd)

Resource	Best Management Practices
Hazardous Materials and Wastes (Cont'd)	▪ The Air Force will ensure that a proper Base Civil Engineer (BCE) Work Clearance Request is processed and routed through 3 CES/CEV for each construction area in accordance with 3rd Wing Instruction 32-1007 (12 July 2001). ▪ The Air Force would ensure that applicable design criteria for reduction of radon in new construction is followed.
Biological Resources	The Air Force would prepare and implement a Moose Habitat Compensation Plan to include the following elements associated with replacement of moose habitat as a result of housing construction: ▪ Enhancement of barren landfill and surrounding areas to provide future high quality moose habitat (distribution of soils on closed landfills). ▪ Land/timber management practices to optimize return of moose habitat. ▪ Establishing appropriate moose harvest levels for succeeding annual moose hunts on both installations. ▪ Design of roadway right-of-ways to be wide enough and sloped appropriately for drivers to adequately spot and avoid moose or other large wildlife species crossing the road. ▪ The Air Force will require that all housing areas be managed to avoid attracting bears and moose. ▪ The Air Force will require that all garbage receptacles outside the home in housing areas be bear-proof. ▪ Feeding songbirds will be disallowed between 15 April and 15 October to avoid attracting bears to homes and yards. ▪ The Air Force would ensure that design of the housing area minimized moose habitat value in plantings that surround the housing area. To minimize the potential for moose-human conflicts, landscaping for the housing area, road construction and associated activity areas would be restricted to shrubs and trees that have low moose palatability, and are in accordance with species approved by the Base landscape plan. ▪ Base residents will frequently be made aware of the potential for conflicts with moose, bears and other wildlife and how to avoid those risks. ▪ Trails will not be constructed within or along the Ship Creek riparian zone in order to avoid dangerous conflicts with bears.
Cultural Resources	▪ The Air Force would ensure that existing structures on the Fort Richardson property to be transferred to Elmendorf AFB are evaluated for historical significance. ▪ In the event any previously undetected archaeological resources are discovered during earthwork, the construction contractor will be required to stop construction activities in the affected area and contact the Elmendorf AFB Cultural Resources Manager (CRM) or designate. The CRM will follow the procedures in Section 4.5.1 (Inadvertent Discovery of Archaeological Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties. ▪ In the event that any Alaska Native human remains are encountered during construction, excavation will stop and the Elmendorf AFB Cultural Resources Manager will be notified immediately. The CRM will follow the procedures in Section 4.5.2 (Discovery of Human Remains) of the ICRMP and will then notify SHPO and appropriate Alaska Native Groups.
Geological Resources	▪ The Air Force would ensure that specific recommendations included in the geotechnical investigation for the MFH areas are followed to the maximum extent practicable. ▪ Best management practices identified for Water Resources would ensure that potential impacts to geologic resources and excessive erosion are avoided or minimized.
Infrastructure and Utilities	▪ The Air Force would consider long-term improvements to the wastewater treatment system associated with Base development and growth. ▪ The Air Force would perform routine analyses to detect leaks, infiltration or system failure. ▪ The Air Force would continue to promote best management practices to prevent roadway and facility deterioration that could result from improper storm water drainage.

Table 10. Summary of Best Management Practices for Fort Richardson (Cont'd)

Resource	Best Management Practices
Infrastructure and Utilities	▪ The Air Force would identify areas essential to the management of snow removal and storm water drainage systems, and preserve such areas, in planning for Base development and growth. ▪ New housing units would include energy conservation techniques and energy efficient equipment to achieve reductions in natural gas consumption. This energy consumption reduction would enhance the ability of Elmendorf AFB to achieve the reduction goals specified in AFI 32-7080. ▪ The Air Force will continue its study of power alternatives to identify options for providing adequate electrical power for the future. ▪ The Air Force would ensure that debris and construction wastes are recycled to the maximum extent possible. ▪ The Air Force will require that the housing area be managed to avoid attracting bears and moose. Outdoor solid waste receptacles in the housing area will be bear-proof.
Transportation Systems	▪ The Air Force would coordinate design and construction of the proposed road with Municipality of Anchorage Planning, Development and Public Works and the U.S. Department of Transportation (Federal Highway Administration) to ensure that the Glenn Highway can accommodate future traffic flows on roadways, intersections and ramps. ▪ In order to avoid potential traffic conflicts, the Air Force would ensure that Bartlett High School and DoD/VA Hospital are notified of the construction schedule.
Public Services	The Air Force would coordinate any future proposed changes in public services needs with the appropriate local police and fire protection agencies as well as emergency medical service providers.
Safety	(None)

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by, or could affect the Proposed Action, No Action Alternative, or the Alternative Action at Elmendorf AFB and Fort Richardson. Within this context, only those Base-specific components relevant to the potential impacts are described in detail.

3.1 INSTALLATION HISTORY AND CURRENT MISSION

3.1.1 History

Elmendorf AFB. In 1940, the U.S. Army Air Corps began building a major permanent airfield on the west side of the existing Fort Richardson. The airfield was named after Capt Hugh M. Elmendorf, who was killed in an experimental aircraft flight test accident in 1933. The 18th Pursuit Squadron arrived in Alaska in early 1941 followed by assignment of the 28th Air Base Group for Base support. As World War II developed, other units were deployed to Alaska because of the threat of the imperial Japanese fleet. Elmendorf Airfield assumed a role as a strategic command and control center for the defense of Alaska.

Following WWII, the installation redirected its focus on the growing military capabilities of the USSR. In 1951, the Air Force obtained ownership of the Base and renamed it Elmendorf Air Force Base. The installation proceeded to provide regional air defense for the North American continent. The collapse of the Russian economy resulted in changes in the organizational mission of the Base as well as force modernization. Elmendorf AFB served as a strategic aviation point for the Great Circle routes between North America, Asia and Europe.

Today, Elmendorf AFB provides military, industrial, administrative, commercial, residential and recreational activities in a complex community composed of military and non-military personnel. The 3rd Air Base Wing at Elmendorf AFB is host unit to Pacific Air Forces, Fighter Squadrons (12th, 19th and 90th), 517th Airlift Squadron, 962nd Airborne Air Control Squadron, and the U.S. Army 6th Infantry Division.

Fort Richardson. In 1940, the U.S. War Department renamed Elmendorf Field after Brigadier General Wilde P. Richardson, who served three tours of duty in the rugged Alaska Territory between 1897 and 1917. The first mission of Fort Richardson was to defend southern Alaska by establishing a permanent air base, supply depot and garrison. When Pearl Harbor was attacked in 1941, the installation was charged with defending Alaska from invasion and coordinating the war effort. Approximately 7,800 troops were stationed at Fort Richardson including the 4th Infantry, 81st Field Artillery and 75th Coast Artillery. After World War II, DoD reduced military forces in Alaska, with Fort Richardson and Fort Wainwright (known at that time as Ladd Army Airfield) remaining active. In 1947, Army troops were assigned to the Alaskan Command, the nation's first unified command staffed jointly by Army, Navy and Air Force officers. As a result of the intensive building program in the 1950s, Fort Richardson became the largest and most modern of Alaska's Army installations.

In 1975, Fort Richardson became headquarters for the 172nd Infantry Brigade (Alaska). In a subsequent realignment, the installation became headquarters for the 6th Infantry Division (Light) and United States Army Garrison, Alaska. The division became closely aligned with DoD forces in the Pacific. After moving to Fort Wainwright in 1990 and reorganized as a light infantry brigade, the 6th Infantry Division was inactivated in 1994. Fort Richardson then became headquarters for United States Army Alaska (USARAK) and the 172nd Infantry Brigade was reactivated.

3.1.2 Mission

Elmendorf AFB. The mission of Elmendorf AFB is to support and defend U.S. interests in the region and around the world by providing units that are ready for worldwide air power projection. The mission of the Base is also to provide capability to meet theater staging and throughput requirements for the Pacific Command.

Fort Richardson. The mission of USARAK is to command and control United States Army forces in Alaska and to provide the services, facilities and infrastructure to support power projection and training to rapidly deploy Army forces from Alaska in the conduct of contingency operations within the Pacific theater and elsewhere as directed (USARAK, 2001a).

3.2 NOISE

3.2.1 Noise Descriptors

Noise is usually defined as unwanted sound, a definition that includes both the psychological and physical nature of the sound (AIHA, 1986). Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work, and may affect human health and well being in various ways.

Sound pressure level can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound pressure levels are easily measured, but the variability is subjective and physical response to sound complicates the analysis of its impact on people. The relative magnitude of sound sensation is judged by subjective terms such as “loudness” or “noisiness”. Table 11 presents the subjective effect of changes in sound pressure level.

Table 11. Subjective Effects of Changes in Sound Pressure Level

Change in Sound Level (dB)	Apparent Loudness
3	Just perceptible
5	Clearly noticeable
10	Half or twice as loud
20	Much quieter or louder

Source: Bies and Hansen, 1988

Different sounds have different frequency content. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term “A-weighted” refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards Institute (ANSI, 1997). The A-weighted noise level has been found to correlate well with people’s judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 7 depicts the typical A-weighted sound pressure levels for various sources. For example, 65 dBA is equivalent to normal speech at a distance of three feet.

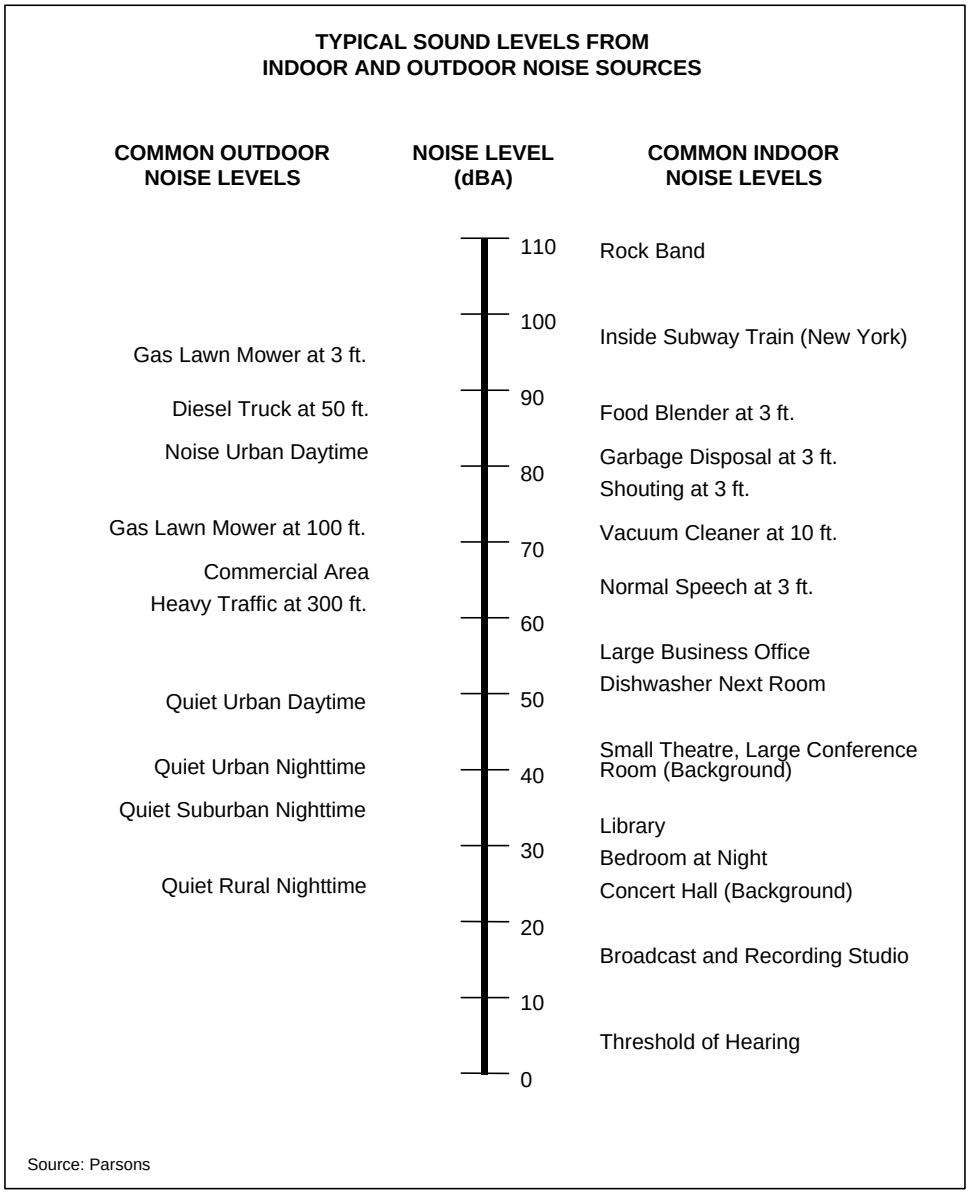


Figure 7. Typical A-Weighted Noise Levels

Another descriptor, day-night average sound level (DNL), was developed to evaluate the total daily community noise environment. DNL is the energy averaged A-weighted acoustical levels for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 A.M.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the quiet nighttime hours. Federal agencies such as the DoD, the United States Environmental Protection Agency (USEPA), the Federal Aviation Administration (FAA), and the United States Department of Housing and Urban Development (HUD) have adopted DNL as the accepted unit for quantifying human annoyance to general environmental noise.

The sound exposure level (SEL) is used to supplement the DNL, especially where sleep disturbance is a concern. The SEL value represents the A-weighted sound level integrated over the entire duration of the noise event and referenced to duration of one second. When an event lasts longer than one second, the SEL value will be higher than the highest sound level during the event. The maximum sound level (L_{max})

is the highest instantaneous sound level observed during a single noise event no matter how long the sound may persist.

3.2.2 Noise Criteria and Regulations

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise.

According to Air Force, FAA and HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds the DNL of 75 dBA; "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dBA; and "normally acceptable" in areas exposed to noise where the DNL is 65 dBA or less. DNL is the energy average A-weighted acoustical levels for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 A.M.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the quiet nighttime hours. DNL has been adopted by federal agencies including the DoD, USEPA, FAA, and HUD as the accepted unit for quantifying human annoyance to general environmental noise.

The Federal Interagency Committee on Urban Noise (FICON) developed land use compatibility guidelines for noise in terms of DNL (USDOT, 1980). DNL is the metric used by the Air Force in determining noise impacts of military airfield operations for land use planning. Air Force land use compatibility guidelines (relative to DNL values) are documented in the Air Installation Compatible Use Zone (AICUZ) Program Manager's Handbook (USAF, 1999). Four noise zones are used in AICUZ studies to identify noise impacts from aircraft operations. These noise zones range from DNL of 65 dBA to DNL of 80 dBA. For example, it is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks be located where the noise is expected to exceed a DNL of 65 dBA. If noise sensitive structures are located in areas within a DNL range of 65 to 75 dBA, the structures should be designed to achieve a 25 to 30 dBA interior noise reduction. Some commercial and industrial uses are considered acceptable where the noise level exceeds DNL of 65 dBA. For outdoor activities, the USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any noise effects (USEPA, 1974).

Air Force policy for many years has been to implement, where feasible, noise level reduction (NLR) measures in on-base residential and public use buildings. NLR measures are intended to reduce indoor noise levels to DNL 45 dBA or less. Recommended NLR for family housing is 25 dBA for units in the DNL 65 to 70 dBA noise zone and 30 dBA for those in the DNL 70 to 75 dBA zone. Buildings constructed before implementation of the noise reduction policy were not necessarily built to NLR standards. Since implementation of the NLR standards, all new buildings are designed and constructed to comply with the appropriate NLR standards (USAF, 1978).

Hearing Loss. Hearing loss is measured in decibels and refers to a permanent auditory threshold shift of an individual's hearing. The USEPA has recommended a limiting daily equivalent energy value, or L_{eq}, of 70 dBA to protect against hearing impairment over a period of 40 years (USEPA, 1974). This daily energy average would translate into a DNL value of approximately 75 dBA or greater. Based on a USEPA study, hearing loss is not expected in people exposed to a DNL of 75 dBA or less (USEPA, 1974). The potential for hearing loss involves direct exposure on a regular, continuing long-term basis to DNL levels above 75 dBA. The Federal Interagency Committee on Urban Noise states that hearing loss due to noise: 1) may begin to occur in people exposed to long-term noise at or above a DNL of 75 dBA; 2) will not likely occur in people exposed to noise between a DNL of 70 and 75 dBA; and 3) will not occur in people exposed to noise less than a DNL of 70 dBA (USDOT, 1980).

An outdoor DNL of 75 dBA is considered the threshold above which the risk of hearing loss is evaluated. Following guidelines recommended by the Committee on Hearing, Bioacoustics, and Biomechanics, the average change in the threshold of hearing for people exposed to DNL equal to or greater than 75 dBA was evaluated. Results indicated that an average of 1 dBA hearing loss could be expected for people

exposed to DNL equal to or greater than 75 dBA. For the most sensitive 10 percent of the exposed population, the maximum anticipated hearing loss would be 4 dBA. These hearing loss projections must be considered conservative as the calculations are based on an average daily outdoor exposure of 16 hours (7:00 a.m. to 10:00 p.m.) over a 40-year period. It is doubtful that any individual would spend this amount of time outdoors within the DNL equal to or greater than 75 dBA.

Speech Interference. One of the ways that noise affects daily life is by prevention or impairment of speech communication. In a noisy environment, understanding speech is diminished when speech signals are masked by intruding noises. Reduced speech intelligibility also may have other effects. For example, if speech understanding is interrupted, performance may be reduced, annoyance may increase, and learning may be impaired. Research suggests that noises that exceed the L_{max} of approximately 60 dB interfere with speech communication (Pearsons and Bennett, 1974; Crook and Langdon, 1974). Increasing the level of noise to 80 dB reduces the intelligibility to zero, even if the people speak in loud voices.

Sleep Interference. The effects of noise on sleep are a concern, primarily in residential environments. When evaluating sleep disturbance, studies have correlated SEL values with the percent of people awakened. The Air Force has developed a dose-response model to predict “percent awakened” as a function of single event noise levels. This model is based on a statistical adjustment of the most recent inclusive analysis of published sleep disturbance studies (Pearsons, et al., 1989).

The FICON recommends this relationship be used in environmental assessments and environmental impact statements when supplemental analysis of potential sleep disturbance is necessary. Most of these relationships, however, do not reflect habituation and, therefore, would not address long-term sleep disturbance effects. SEL takes into account an event’s sound intensity, frequency content, and time duration, by determining the total A-weighted sound energy spectra of the event and incorporating it into a single number. Unlike DNL, which describes the daily average noise exposure, SEL describes the normalized noise from a single noise event.

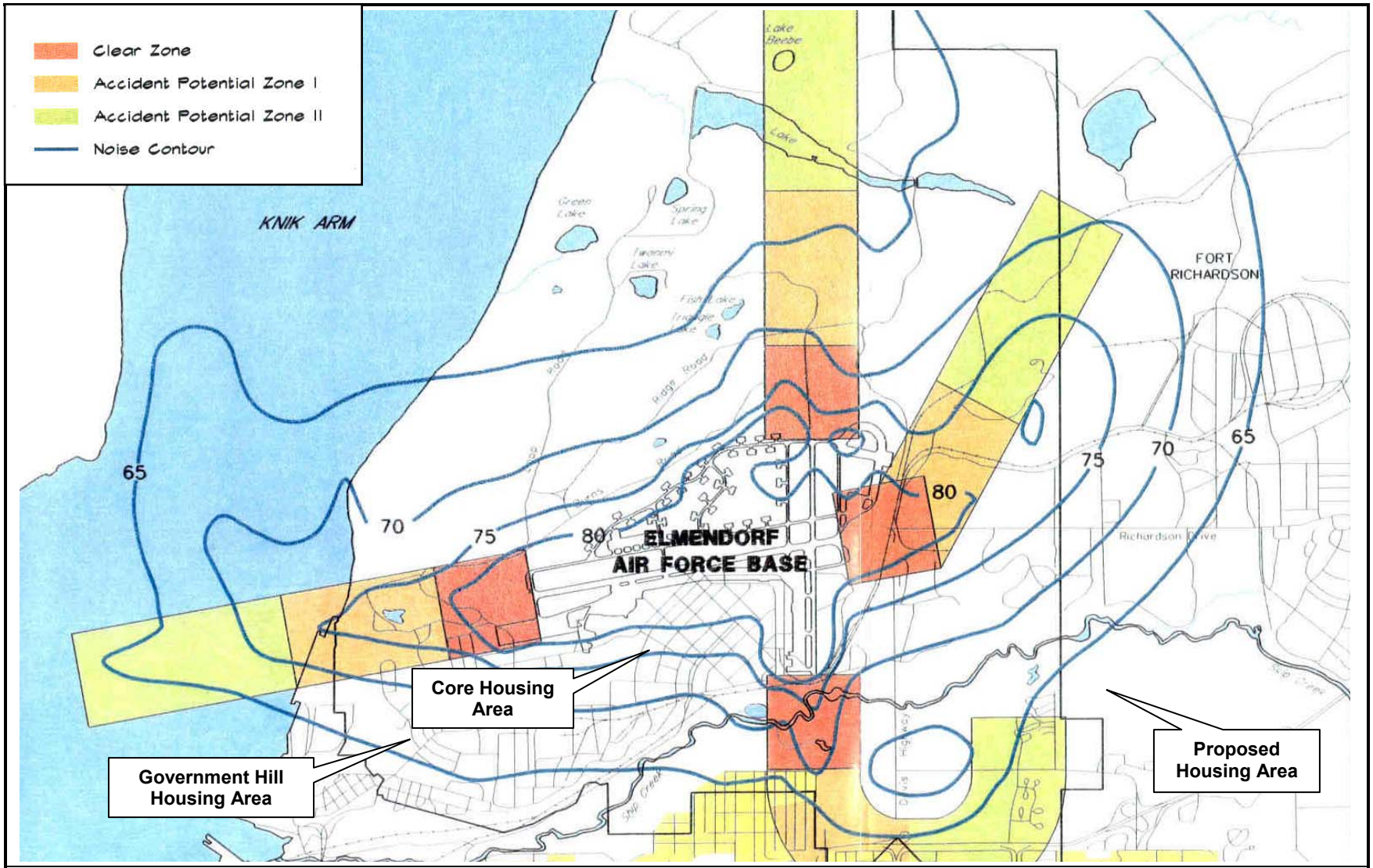
Sleep disturbance rates are unlikely to be affected by aircraft noise below 90 dB SEL and, for events with SELs in the range of 90 to 100 dB, the chance of an average person being awakened is about 1 in 75 (1.33 percent). Although events with SEL greater than 100 dB are more likely to result in sleep disturbance, no specific dose-response relationship between SEL and percent awakening is suggested.

3.2.3 Baseline Noise Conditions

Elmendorf AFB. Airfield operations are the primary source of noise at Elmendorf AFB. The Base maintains two operational runways and noise level contours extend in northeasterly and westerly directions. Aircraft activities include pilot training, aircraft maintenance, and transient military aircraft operations. During periods of no flying activity at Elmendorf AFB, noise results primarily from aircraft maintenance and shop operations, ground traffic movement, occasional construction, and similar sources. This noise is almost entirely restricted to Base property and is comparable to sounds that occur in typical urban communities. It is primarily during periods of aircraft ground or flight activity that the noise environment changes.

Noise from aircraft operations at Elmendorf AFB has been characterized in noise studies conducted as part of the AICUZ program. Figure 8 is the AICUZ diagram for Elmendorf AFB. The noise levels shown on this figure define the baseline noise conditions at Elmendorf AFB:

- Most of the units in the Government Hill Housing Area are within the 65 to 70 DNL contour with northern portions of the Cherry Hill MFH within the 70 to 75 DNL contour. The undeveloped land adjacent to Cherry Hill and Boulder MFH is within the DNL 65 to 70 dBA noise zone.



Source: USAF, 2001b

NORTH

0 2000 4000 8000

SCALE IN FEET

Baseline AICUZ Noise Levels at Elmendorf AFB

Figure 8

- The Core Housing Area is located south of, and closer to, the flightline. Housing units in the northern portion of Seattle MFH are within the DNL 75 to 80 dBA noise zone. Undeveloped land adjacent to the FO/CO area is within the DNL 70 to 75 dBA noise zone.

Fort Richardson. The existing noise environment on Fort Richardson is influenced by weapons training activities on the northwestern portion of the installation. Two primary noise zones with significant noise exposure and severe noise levels have been identified associated with training areas, as shown on Figure 9.

Existing noise levels on the proposed site to be transferred to Elmendorf AFB is influenced by flightline activities on Elmendorf AFB, as shown on Figure 8. Airfield operations on Elmendorf AFB predominates the noise environment, with less influence from the noise of Army training operations north of the site. Noise levels associated with Bryant Army Airfield is limited to fixed-wing and rotary aircraft used by the Alaska Army National Guard, while helicopter landing zones are located north, east and south of the proposed site. Existing noise levels on the proposed site are expected to be would be less than the 65 DNL noise level.

3.2.4 Future Noise Conditions

Elmendorf AFB. Future noise levels at Elmendorf AFB would be expected to change as a result of future F-22 operations. The amount of land encompassed by the 65 DNL noise contour and greater is projected to increase on Elmendorf AFB. A comparison of baseline and projected noise levels for Elmendorf AFB is shown on Figure 10. Under planned noise levels, the Government Hill Housing Area and Cherry Hill MFH would be within the 70 to 75 DNL contour. A greater portion of the Core Housing Area would be within the 70 to 80 DNL noise zone.

Fort Richardson. Future noise conditions on Fort Richardson are expected to remain relatively similar to existing conditions with zones of significant and severe noise levels on the north portion of the installation, as shown on Figure 9.

Future noise levels on the northwest corner of the proposed site would be within the projected 65 DNL noise level, with the remaining portion of the site below the 65 DNL noise level, as shown on Figure 9.

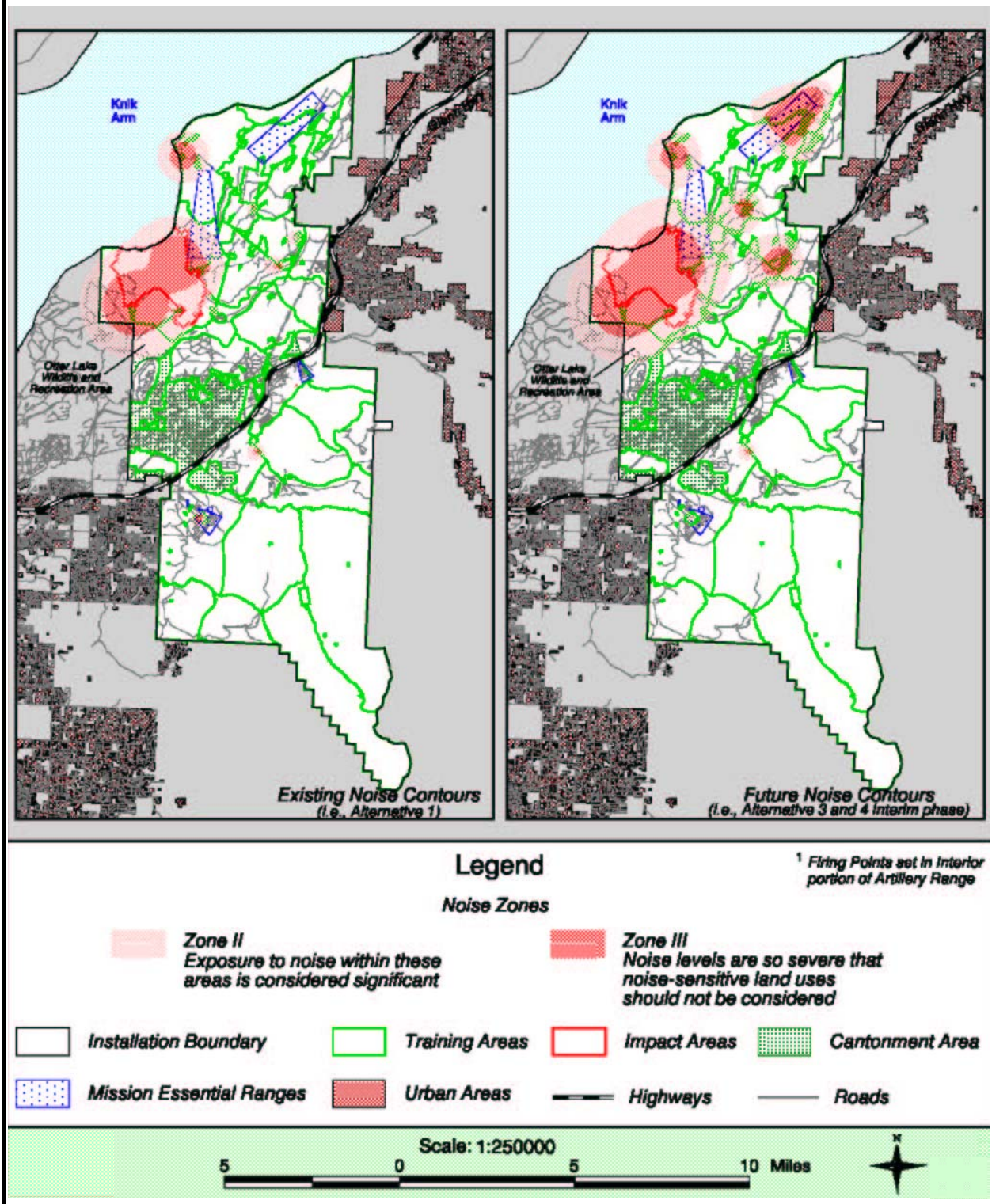
3.3 LAND USE

3.3.1 Land Use Plans and Policies

Elmendorf AFB. To guide future development and land use decisions for the Base, the Air Force has prepared a land use component to the General Plan for Elmendorf AFB (USAF, 1998b). The land use component identifies and analyzes the functional relationships of organizational units and activities assigned to Elmendorf AFB, and supports the existing and future mission requirements by allocating or reserving the land necessary to support ongoing and proposed operations.

The Integrated Natural Resources Management Plan (INRMP) for Elmendorf AFB has identified eight land management units and five special interest areas on the Base that would require special considerations or unique management activities (USAF, 2000).

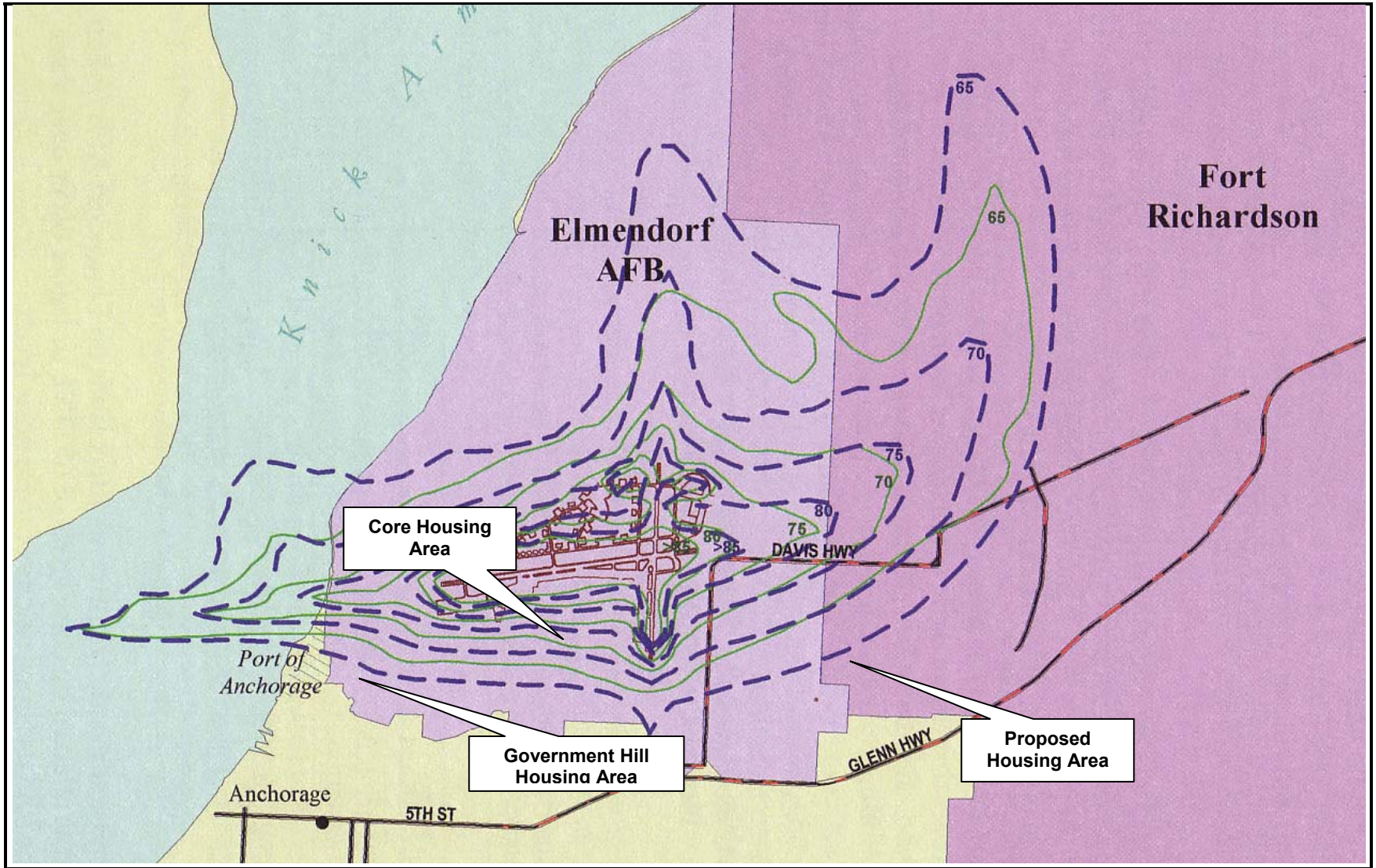
Fort Richardson. The U.S. Army Alaska manages land resources to achieve its training and testing objectives, maintain force readiness and ensure environmental stewardship. The Integrated Training Area Management (ITAM) program is the Army's formal strategy for sustaining use of training and testing lands (USARAK, 2001a).



Source: Formoso, 2003

Comparison of Noise Levels on Fort Richardson

Figure 9



Source: USAF, 2001a

NORTH

Projected Noise Contours (DNL) for future F-22 operations.
Baseline Noise Contours (DNL) from operations as they occur under mission taskings and deployment.
Runway

0 0.5 1 1.5 2 2.5

APPROXIMATE SCALE IN STATUTE MILES

Baseline and Projected Noise Level Contours at Elmendorf AFB

Figure 10

The Integrated Natural Resources Management Plan (INRMP) for Fort Richardson has identified three land uses on the installation: cantonment, ammunition area and training areas. The Ship Creek Riparian Area is the only special interest management area on the installation in the vicinity of the proposed site for housing (USARAK, 2001a).

3.3.2 Existing Land Use

Elmendorf AFB. Developed areas on Elmendorf AFB are primarily in the southern third of the installation and bordered by Fort Richardson to the east, the Municipality of Anchorage to the south, and the Knik Arm to the west. The airfield is the dominant land use feature, and it is located near land uses that include industrial, aircraft operations and maintenance, and open space. Other land uses in the cantonment area are generally oriented southwest of the airfield. Six individual areas on Elmendorf AFB have restrictions on land use due to environmental concerns. Existing land use on Elmendorf AFB is shown on Figure 11.

The developed area of the Base consists of two distinct areas separated by an industrial area that stretches from the airfield to the installation boundary. Housing facilities (accompanied and unaccompanied), administrative facilities, community commercial and service buildings, outdoor recreation areas and open space comprise each of the developed areas.

With isolated land uses found throughout the Base, the existing land use pattern at Elmendorf AFB exhibits land use incompatibilities. The current land use design resembles functions of individually sited buildings rather than a system that would provide for maximum aesthetic quality, functional efficiency and utility, and available land for mission and installation growth (USAF, 1998b).

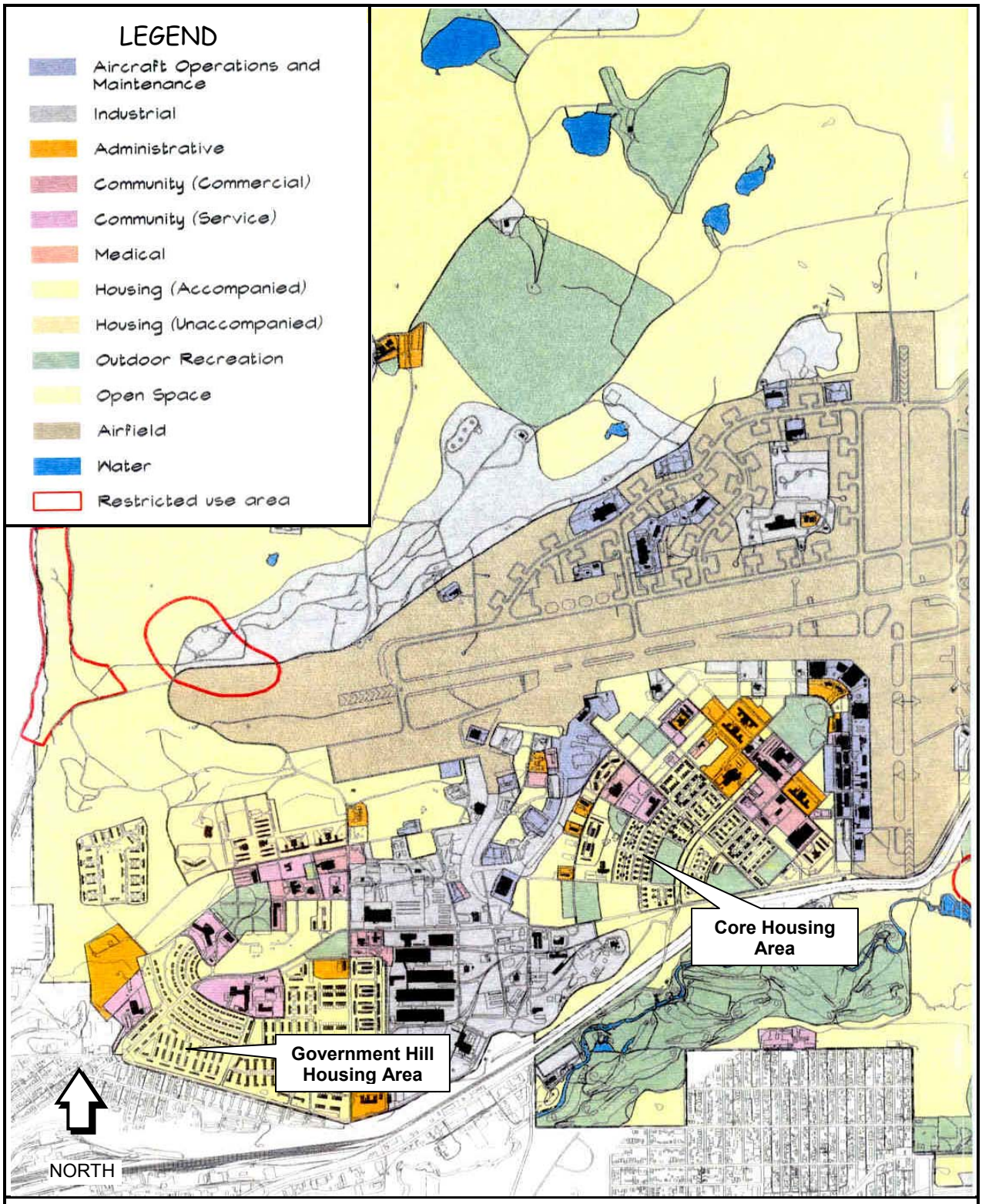
As defined in the INRMP, the eight land management units at Elmendorf AFB are: (1) EOD Watershed; (2a) Six-Mile West; (2b) Six-Mile East; (3) Kettle Lakes; (4) Moraine; (5) Ship Creek; (6) Main Cantonment Area; and, (7) Coastal Mudflats. The housing areas and undeveloped land associated with the Proposed Action are located within Area 6 (Main Cantonment Area).

Special interest areas identified in the INRMP include land management units 1, 2a, 2b, 3 (Hillberg/Green Lake Recreation Area) and 5 (Ship Creek Riparian Zone). Other special interest areas have been set apart from normal management practices within the unit, and these areas include wetlands and riparian areas such as Six-Mile Creek, EOD Creek, the unnamed creek that connects Green Lake to Cook Inlet, and wetlands interspersed throughout the Base. The land associated with the Proposed Action is entirely within Area 6 (Main Cantonment Area) and does not overlay any special interest areas.

The existing MFH areas for Phase II PSF housing privatization (Government Hill and Core housing areas) are located on land classified as Accompanied Housing. The undeveloped land adjacent to Cherry Hill MFH is located in open space. The undeveloped land adjacent to Boulder MFH is located on land classified as outdoor recreation, administrative and open space. The undeveloped land adjacent to the FO/CO area is classified as open space.

As shown on Figure 8, the northern portion of the existing Cherry Hill MFH is located within Accident Potential Zone (APZ) I of the west end of the runway. The APZ I includes an area 3,000 feet wide by 5,000 feet long beginning 3,000 ft from the runway endpoint along and centered on the extended runway centerline. Land use planning and controls are strongly encouraged in these areas for the protection purposes. The existing location of the northern portion of the Cherry Hill MFH represents an existing land use conflict on Elmendorf AFB.

Fort Richardson. Existing land use on Fort Richardson includes 5,760 developed acres in the cantonment area located along the Glenn Highway near the center of the installation. The remaining 55,000 acres are comprised of maneuver and impact areas that include training areas, firing ranges, landing zones and drop zones (USARAK, 2001a).



Source: modified from USAF,1998b

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SCALE IN FEET

Existing Land Use on Elmendorf AFB

Figure 11

The proposed site for housing construction on Fort Richardson is located in Training Area 15, south of the cantonment and south of Ship Creek. The proposed site is north of Bartlett High School. This training area has not been used by the Army in recent years. Ammunition Storage Area A is located approximately 1.5 mile north of Ship Creek. Ammunition Storage Area B is located less than a mile northwest of the proposed site.

Public access into training areas on Fort Richardson is allowed (subject to safety restrictions and military security) when access does not impair the military mission, as determined by the installation commander. Activities that are not compatible with training areas include any permanent non-military structures, easements, or leases (USARAK, 2001a).

Fort Richardson is managed for a variety of public recreational uses, although such areas may be closed temporarily during periods of military use. Public recreation areas on the installation vary depending on the season. Off-limits areas are restricted to public access and use on a year round basis. The outdoor recreation management designation of the proposed site to be transferred to the Air Force is Limited Recreation (open to hiking, skiing, berry picking, birdwatching, and other low impact activities). No motorized vehicles are allowed. During March to May and November to February each year, existing trails through the proposed site have been used by Bartlett High School for cross country running and cross-country skiing.

The U.S. Bureau of Land Management (BLM) holds timber rights for most Fort Richardson lands. Vegetation manipulation by USARAK on lands where the BLM holds rights must be approved by the BLM. Timber harvests are permitted while management of the area is primarily for military use. Forest management on Fort Richardson is required in accordance with Public Laws 106-65 (Military Land Withdrawal Act) and 86-797 (Sikes Act).

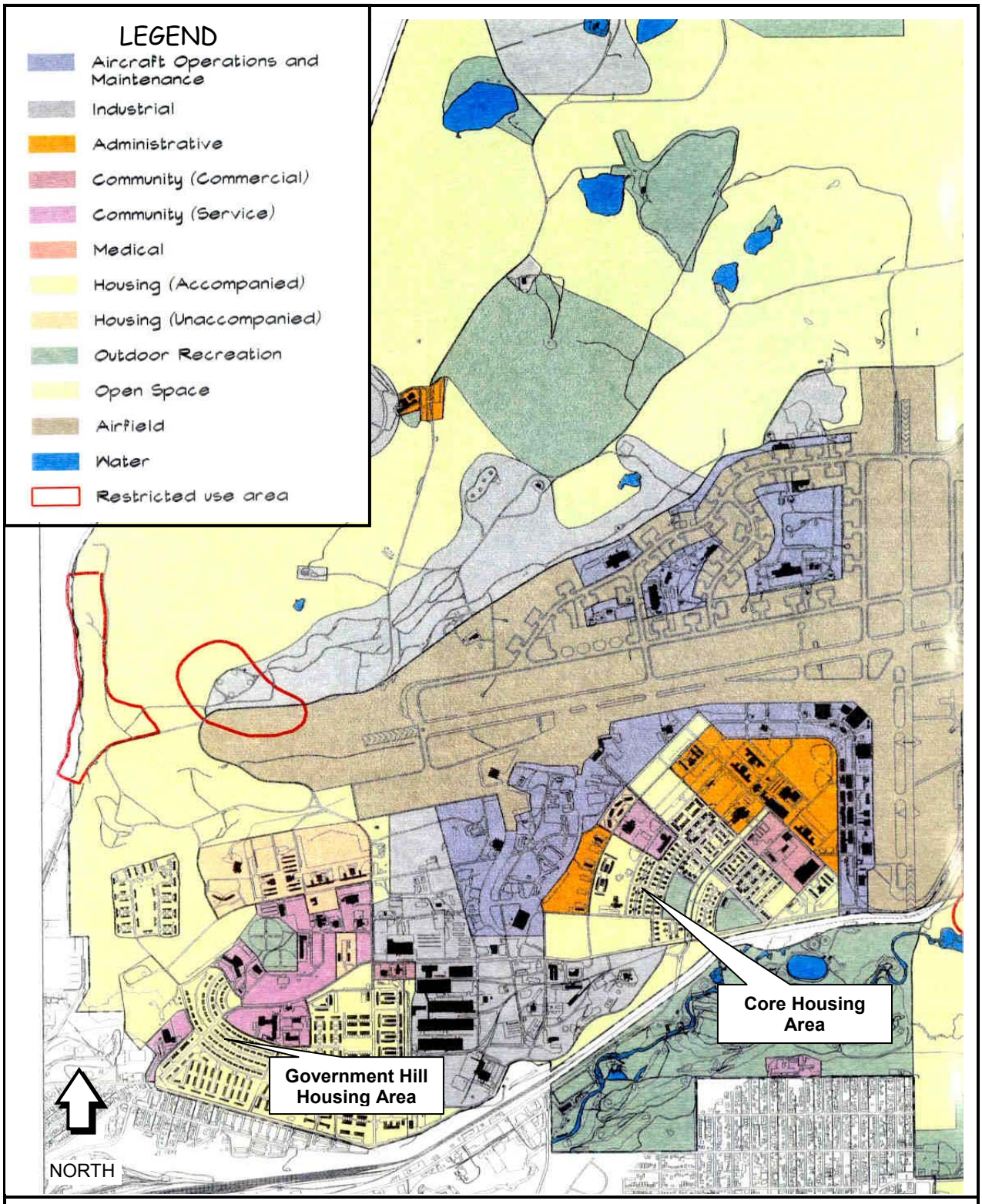
The Army has conducted an inventory of forest resources on Fort Richardson. High, medium and low priority forest management areas have been identified for forest management actions to be accomplished from 2002 through 2006. The proposed site to be transferred to the Air Force is located on forest management area that is designated as Protected (no forest management is planned for this area).

3.3.3 Future Land Use

Elmendorf AFB. The land use component of the 1998 General Plan identified the future land use plan for Elmendorf AFB (Figure 12). In an effort to consolidate and simplify land uses, several mixed land uses were consolidated into larger and contiguous areas. Administrative functions were consolidated within the central core of the Base. The future land use plan identifies land for community commercial use along Provider Drive.

As shown on Figure 12, the future land use designation for the Government Hill and Core housing areas is Accompanied Housing. The undeveloped land adjacent to Cherry Hill MFH is located in open space. The undeveloped land adjacent to Boulder MFH is located on land classified as accompanied housing and open space. The undeveloped land adjacent to the FO/CO area is classified as open space.

Fort Richardson. The Army has developed a future land use plan for Fort Richardson. The plan consolidates housing, community facilities, outdoor recreation and administrative facilities in the cantonment area while training areas north and southwest of the cantonment. The future land use designation for the proposed site on Fort Richardson is Family Housing, as shown in Figure 13.



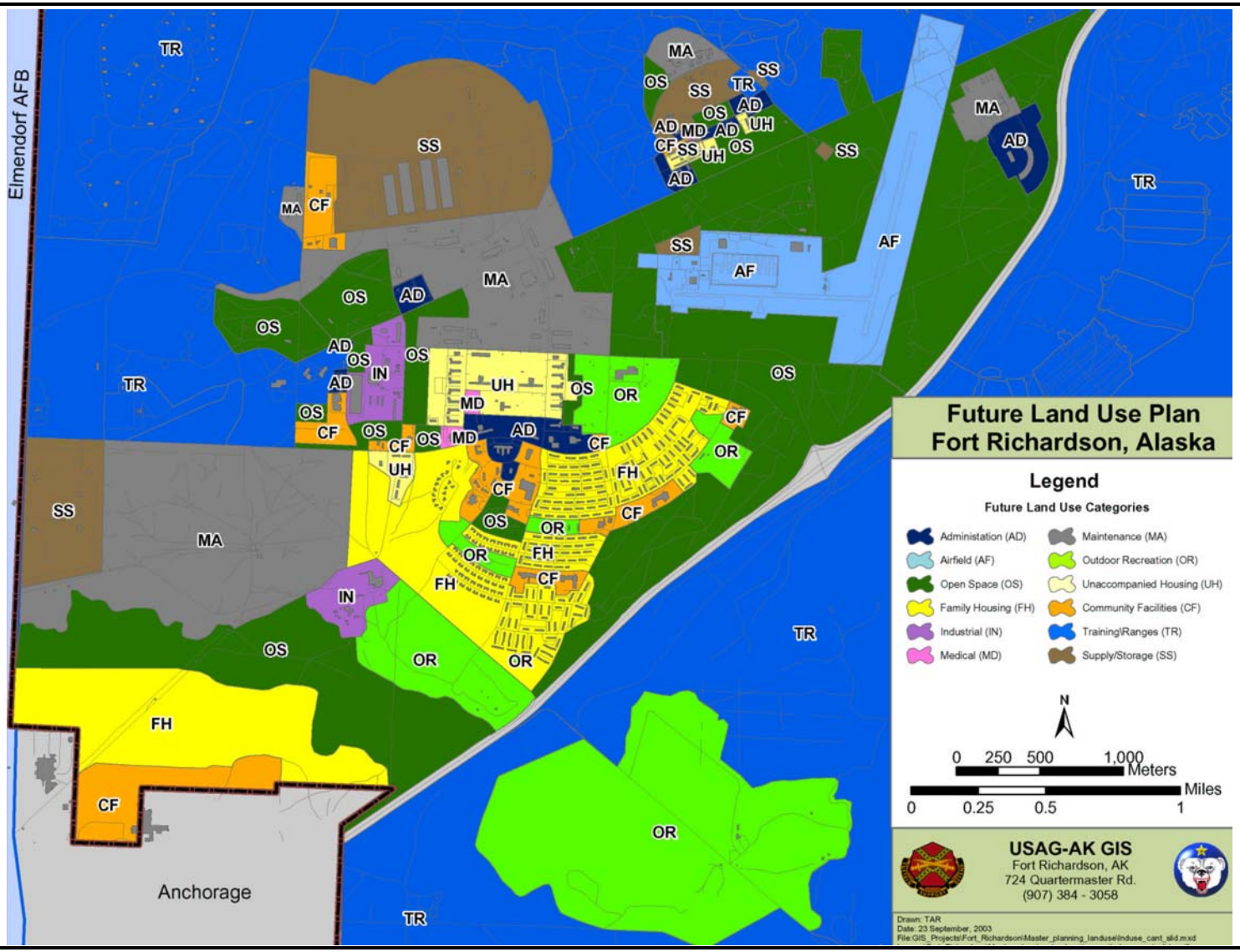
Source: modified from USAF,1998b

0 1100 2200 4400

SCALE IN FEET

Future Land Use on Elmendorf AFB

Figure 12



Future Land Use Plan for Fort Richardson
Figure 13

3.4 AIR QUALITY

3.4.1 Climate and Meteorology

The climate at Elmendorf AFB and Fort Richardson is transitional between the interior climate of Alaska and the maritime climate of coastal Alaska. This climate is shielded by the nearby Alaska Range, Talkeetna and Chugach Mountains. The Pacific Ocean's Alaska Current is also a moderating influence on the climate at Elmendorf AFB. Summers are cool, ranging from 47 to 65 degrees F. Winters are cold, varying from 4 to 30 degrees F. The mean annual temperature at Fort Richardson is 35 degrees F. Average annual precipitation for the Elmendorf AFB area is 16.1 inches, with most rainfall occurring from June through October. Annual snowfall on Elmendorf AFB averages approximately 40 inches.

3.4.2 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, the size of the air basin, and by the prevailing meteorological conditions.

The Clean Air Act (CAA) Amendments of 1990 directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure cleaner air for all Americans. The promulgation of the CAA was driven by the failure of nearly 100 cities to meet the national ambient air quality standards (NAAQS) for ozone and carbon monoxide and by the inherent limitations in previous regulations to effectively deal with these and other air quality problems.

The USEPA established both primary and secondary NAAQS under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. The CAA also set emission limits for certain air pollutants for new or modified major sources based on best demonstrated technologies, and established health-based national emissions standards for hazardous air pollutants.

NAAQS are currently established for six air pollutants (known as "criteria air pollutants") including carbon monoxide (CO), nitrogen oxides (NO_x, measured as nitrogen dioxide, NO_2), ozone (O_3), sulfur oxides (SO_x, measured as sulfur dioxide, SO_2), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 microns, collectively referred to as total suspended particulates (TSP).

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered as an air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. O_3 is formed in the atmosphere from its precursors, NO_x and volatile organic compounds (VOC), which are directly emitted from various emission sources. For this reason, NO_x and VOC are commonly reported in an air emissions inventory instead of O_3.

The CAA does not make the NAAQS directly enforceable, but requires each state to promulgate regulatory requirements necessary to implement the NAAQS. The CAA also allows states to adopt air quality standards that are more stringent than the federal standards. The State of Alaska Department of Health has adopted state ambient air quality standards that are as stringent as, or more stringent than, the NAAQS, as shown in Table 12.

Table 12. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[a,b,c]	Secondary NAAQS[a,b,d]	Alaska Standards[a,b]
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 μg/m^3) 35 ppm (40,000 μg/m^3)	No standard No standard	9 ppm 35 ppm
Lead	Quarterly	1.5 μg/m^3	1.5 μg/m^3	1.5 μg/m^3
Nitrogen Oxides (measured as NO_2)	Annual	0.0543 ppm (100 μg/m^3)	0.0543 ppm (100 μg/m^3)	0.053 ppm
Ozone	1-hour	0.12 ppm (235 μg/m^3)	0.12 ppm (235 μg/m^3)	0.12 ppm
Particulate Matter (measured as PM_{10})	Annual 24-hour	50 μg/m^3 150 μg/m^3	50 μg/m^3 150 μg/m^3	50 μg/m^3 150 μg/m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.03 ppm (80 μg/m^3) 0.14 ppm (365 μg/m^3) No standard	No standard No standard 0.50 ppm (1,300 μg/m^3)	0.03 ppm 0.14 ppm 0.50 ppm (1,300 μg/m^3)

[a] National and state standards, other than those based on an annual or quarterly arithmetic mean, are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is less than or equal to one.
[b] The NAAQS and Alaska standards are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury.
[c] National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA.
[d] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

3.4.3 Local Air Quality

The USEPA classifies the air quality within an area according to whether or not the concentration of criteria air pollutants in the atmosphere exceeds primary or secondary NAAQS. All areas within each air quality control region (AQCR) are assigned a designation of either attainment or nonattainment for each criteria air pollutant. An attainment designation indicates that the air quality within specific areas of an AQCR is either "unclassified" or that the air quality is as good as or better than NAAQS for individual criteria air pollutants. Unclassified indicates that the air quality within an area cannot be classified and is therefore treated as attainment. Nonattainment indicates that concentration of an individual criteria air pollutant at a specific location exceeds primary or secondary NAAQS. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for three consecutive years and through extensive dispersion modeling, demonstrate that attainment status can be maintained in the future even with community growth.

The State of Alaska Department of Environmental Conservation (ADEC) has primary jurisdiction over air quality and stationary source emissions at Elmendorf AFB. The Base is located on the outskirts of the Anchorage metropolitan area within the Cook Inlet Intrastate AQCR No. 8. This AQCR encompasses 44,000 square miles including the Municipality of Anchorage, the Kenai Peninsula Borough, and the Matanuska-Susitna Borough. Regional air pollutant emissions for the Anchorage area are shown on Table 13.

Table 13. Regional Air Pollutant Emissions in AQCR No. 8

Location	CO (tons/yr)	VOC (tons/yr)	NO_x (tons/yr)	SO_2 (tons/yr)	PM_{10} (tons/yr)
Cook Inlet Intrastate AQCR No. 8	332,021	56,708	28,203	1,780	67,013

Source: USAF, 2001a

Air quality in the Cook Inlet Intrastate AQCR has been designated as either attainment or unclassifiable/attainment for all pollutants with the exception of CO and PM_{10}. The metropolitan Anchorage area is classified as a serious nonattainment area for CO. Eagle River, a community of approximately 25,000 people located 10 miles northeast of Anchorage, has been classified as nonattainment for PM_{10}. The air quality at Elmendorf AFB is classified as attainment for all ambient air quality standards. The Base is located adjacent to the northern boundary of the Anchorage CO nonattainment area. There are no Class I Prevention of Significant Deterioration (PSD) areas within a 62-mile radius of Elmendorf AFB (USAF, 2001a).

Air pollutant emissions at Elmendorf AFB include stationary and mobile sources. Stationary source emissions include jet engine testing (off the aircraft), external combustion sources, degreasing operations, storage tanks, fueling operations, heating, solvent usage, surface coating, asphalt production, and miscellaneous general process operations. The Air Force is in the process of converting units connected to the existing steam plant to individual boilers. Mobile sources of air pollutants are primarily from aircraft operations, aerospace ground equipment, ground support equipment, and maintenance aircraft operations performed with the engines still mounted on the aircraft.

3.5 WATER RESOURCES

The water resources on Elmendorf AFB and Fort Richardson are described in terms of surface water and groundwater conditions.

Elmendorf AFB. The hydrological system at Elmendorf AFB is comprised of four major drainages and a number of man-made lakes and ponds. The major drainages systems are Ship Creek, Six Mile Creek, EOD Creek and Cherry Hill Ditch.

Elmendorf AFB has 12 natural and man-made lakes and ponds varying from one acre to 123.9 acres in surface area. The largest water bodies on the Base are Six Mile Lake, Green Lake, Hillberg Lake and Spring Lake, all of which are north of the Main Base area. There are numerous ponds and wetlands on the Base that area less than one acre in size or seasonally flooded.

Fort Richardson. Water resources on Fort Richardson include streams, lakes, ponds and a saltwater tidal bay. Most streams flow from headwaters in the Chugach Mountains to the Cook Inlet (saltwater), and traverse the installation in a westerly direction. The only surface water feature in the area of the proposed property to be transferred to the Air Force is Ship Creek. None of the 12 named lakes, ponds and several unnamed water bodies covering 348 acres of the installation is located on or near the proposed housing site.

3.5.1 Surface Water

In 1972, the U.S. Congress passed the Federal Water Pollution Control Act to protect surface waters from pollutants in storm water discharges. The USEPA has been given the authority to implement the requirements of the Clean Water Act. Because Alaska is a non-delegated state, the National Pollutant Discharge Elimination System (NPDES) program is administered by the USEPA. Alaska is also required to maintain compliance with the Multi-Sector General Permit (MSGP) program for industrial activities.

Elmendorf AFB. The Government Hill housing area is located in Discharge 8, one of the 13 storm water discharge areas on Elmendorf AFB. Discharge 8 encompasses the southwestern portion of the Main Cantonment Area. Discharge 8, a point source, drains approximately 378 acres from the southwest portion of Elmendorf AFB. Storm water in this drainage area enters the subsurface storm sewer system via catch basins located throughout the drainage area. Storm water within the storm sewer systems empties off site to the west, approximately 800 feet south of the Cherry Hill Ditch, and eventually drains to Knik Arm. Storm water may also infiltrate the ground or evaporate. Approximately 31 percent of this drainage area is impervious. Industrial activities in the Discharge 8 area include vehicle and equipment fueling, maintenance and washing.

The Cherry Hill housing area is located with Discharge 6 and 7, while the Core housing area is located entirely within Discharge Area 7. Discharge 6 is sheet flow drainage of approximately 225 acres in the western portion of the Base. Sheet flow from the northern portion of Discharge 6 travels west off site eventually draining into the Knik Arm. Sheet flow from the southern portion travels west off site into Cherry Hill Ditch, which eventually drains to Knik Arm. Storm water my also infiltrate the ground or evaporate. Less than 15 percent of Discharge 6 drainage area is comprised of impervious surface. The industrial landfill is located in this drainage area.

Discharge 7, a point source, drains approximately 3,586 acres from the central portion of the Base. Storm water in this drainage area enters the subsurface storm sewer system via catch basins throughout the drainage area. Storm water empties into the Cherry Hill Ditch. Approximately 31 percent of this drainage area is impervious. Industrial activities include aircraft and vehicle fueling, maintenance, washing and deicing/anti-icing (USAF, 2001e).

The Air Force has prepared a Storm Water Pollution Prevention Plan (SWPPP) for Elmendorf AFB that identifies pollutant sources that may affect the quality of storm water associated with construction activities at the site. The plan also identifies best management practices (BMP) to reduce pollutants in storm water discharges. Physical, structural and managerial BMPs are described in the SWPPP to minimize or eliminate the potential for spills and leakage of construction materials and erosion of disturbed areas by water and wind. The SWPPP includes: erosion and sediment control; non-storm water management; post-construction storm water management; waste management and disposal; maintenance, and employee training to inspect BMPs.

The only surface water feature in the vicinity of the MFH areas is the Cherry Hill Ditch, a storm drainage system that drains the Main Base area. Year-round flow is maintained by snowmelt and groundwater infiltration. Flow rates range from 3.0 cubic feet per second (cfs) after heavy rains to less than 1.0 cfs.

Fort Richardson. The proposed site is approximately 0.25 mile south of Ship Creek at its closest point. Ship Creek is the second largest source of surface water on the post. It drains a watershed of 117 square miles, 90 of which are in the Chugach Mountains. The Ship Creek watershed is a primary source of drinking water for Fort Richardson and is a protected water body. From the mountains, the creek flows west across a coastal plateau through Fort Richardson. The Anchorage area comprises 27 square miles of the creek's watershed. Ship Creek traverses Fort Richardson for approximately eight miles, including across a forested coastal plain to the western boundary of the installation at an elevation of 230 ft above sea level. Ship Creek and its floodplain above the Glenn Highway is the least disturbed portion of the creek on Fort Richardson.

The quality of surface water on Fort Richardson appears to be good, although localized and temporary sedimentation may have occurred (USARAK, 2001a).

3.5.2 Groundwater

Elmendorf AFB. There are two principal groundwater aquifers identified on Elmendorf AFB, including a shallow unconfined aquifer and a deeper confined aquifer. Between these two aquifers, the Bootlegger Cove formation acts as the confining layer, with apparently no interconnection between the two aquifers.

The shallow aquifer groundwater movement follows, for the most part, that of the surface topography. Flow is to the northwest along the north limb of the moraine, and to the southeast along the south limb. The groundwater divide coincides with the crest of the moraine. This aquifer is not used for drinking water.

The deeper confined aquifer is found under the entire Base and generally flows west, from the Chugach Mountains to the Knik Arm. Elmendorf AFB does not use this aquifer for its main source of drinking water, but as standby drinking water supply when surface water supplies cannot meet the demand. The

Municipality of Anchorage, bordering Elmendorf AFB, uses water from this aquifer for various services including industrial, commercial, domestic, and public supply (USAF, 2000).

Fort Richardson. Two freshwater aquifers underlie most of Fort Richardson. These aquifers flow west from the Chugach Mountains to the Cook Inlet and are recharged by groundwater originating from precipitation in the mountains. The aquifers lie in different soil strata separated by an impermeable clay layer. The upper aquifer can be accessed at depths of less than 50 feet, while the lower aquifer is reached from 300 to 400 feet below the surface. Wells drilled into the aquifer can produce up to 1,500 gallons of water per minute.

Three water wells are classified as inactive and maintained as emergency wells for use in the event that the Ship Creek surface water source is unavailable. Water enters the aquifer for these wells by seeping through fractures in the bedrock as well as from snowmelt. Aquifers are also recharged by streams where surface water is percolated into the ground. The groundwater recharge area for the three wells is designated as the Drinking Water Protection Area, which includes an area defined by the Army as the wellhead protection zone. In this zone, voluntary protection efforts are implemented to prevent the release of contaminants that could impact the drinking water wells (ADEC, n.d.).

Industrial activities on Fort Richardson have resulted in effects on groundwater from underground storage tanks, chemical storage and chemical release. These areas are being intensively monitored and there is no indication of deep groundwater contamination. Restoration projects by the Army have been undertaken to mitigate previous damage to groundwater quality (USARAK, 2001a). Groundwater monitoring wells AP-3450 and AP-3452 are located on the property to be transferred to Elmendorf AFB.

3.6 HAZARDOUS MATERIALS AND WASTES

3.6.1 Hazardous Materials

Hazardous materials (HAZMAT) are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA). Hazardous wastes (HAZWASTE) are defined by the Solid Waste Disposal Act and the Resource Conservation and Recovery Act (RCRA). In general, both HAZMAT and HAZWASTE include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

Elmendorf AFB. All organizations, including contractors, using HAZMAT on Elmendorf AFB must comply with AFI 32-7080, *Pollution Prevention Program,* AFI 32-7086/PACAF Supplemental Hazardous Material Management, and the Elmendorf AFB 3rd Wing Operations Plan 19-3, *Hazardous Waste, Used Oil and Hazardous Materials Management Operating Plan* (OPlan 19-3). The Environmental Flight (3 CES/CEV) manages the Base HAZMAT program and conducts routine inspections to ensure HAZMAT compliance.

Fort Richardson. Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, establishes the Army's responsibility and policy document for environmental quality. Army Pamphlet (PAM) 200-1, *Environmental Protection and Enhancement*, provides the detailed guidance to support implementation of AR 200-1. Chapter 4, Hazardous Materials Management of PAM 200-1, defines requirements and guidance for HAZMAT management at Army installations. The Hazardous Materials Control Group at Army installations implements an intensive and integrated life cycle management approach. In order to closely monitor use of HAZMAT, the Hazardous Substance Management System is used to collect HAZMAT usage and user data. Only those on the Authorized Users List (AUL) may use HAZMAT.

In 2000, the Army prepared an Environmental Management Plan USARAK 200-1 that sets forth the environmental management system (EMS) for its installations in Alaska. The guidance identifies policy, general requirements, training and communications, emergency preparedness and response, monitoring

and measurement and correction actions (USARAK, 2000a). The Army has also prepared a Hazardous Materials and Regulated Waste Management Plan that identifies responsibilities and provides procedures for identifying hazardous materials and regulated waste (USARAK, 2000b).

3.6.2 Hazardous Wastes

Unless otherwise exempted by CERCLA regulations, RCRA Subtitle C (40 CFR Parts 260 through 270) regulations are administered by the USEPA and are applicable to the management of hazardous wastes. HAZWASTE must be handled, stored, transported, disposed, or recycled in accordance with these regulations.

Elmendorf AFB. Elmendorf AFB has a RCRA Part B Permit (AK8570028649) and is a large-quantity HAZWASTE generator. HAZWASTEs on Elmendorf AFB are primarily from industrial activities associated with aircraft operations and maintenance. HAZWASTEs are managed in accordance with the Elmendorf AFB 3rd Wing Operations Plan 19-3, *Hazardous Waste, Used Oil and Hazardous Materials Management Operating Plan* (OPlan 19-3). The Environmental Flight (3 CES/CEV) manages the Base hazardous waste program.

HAZWASTEs are initially stored at either satellite or 90-day accumulation sites located throughout the Base. Elmendorf AFB also has one hazardous waste Treatment Storage and Disposal Facility operated by the Defense Reutilization and Marketing Office (DRMO) located on the Base. Hazardous wastes removed from the Base must be disposed of at U.S. EPA-approved disposal facilities.

The Base conducts routine Environmental, Safety and Occupational Health Compliance and Management Program (ESOHCAMP) inspections to comprehensively evaluate its operations to identify problems and provide recommendations to remedy problem areas.

Fort Richardson. Fort Richardson is a large-quantity hazardous waste generator, with wastes from industrial activities primarily in support of rapid deployment of troops, equipment and supplies, including vehicle and generator maintenance. Hazardous wastes are managed in accordance with PAM 200-1, Chapter 5, Hazardous and Solid Waste Management.

HAZWASTEs are initially stored in satellite accumulation points and then transferred to accumulation areas. Procedures are in place for the management of HAZWASTEs in these facilities prior to transfer for disposal to the DRMO. Compliance inspections of these storage facilities are conducted on a routine basis to ensure compliance with RCRA regulations. HAZWASTE reduction strategies for Fort Richardson are defined in the installation's Integrated Solid Waste Management Plan and Pollution Prevention Plan.

3.6.3 Pollution Prevention Program

Elmendorf AFB. The Air Force has taken a proactive and dynamic role in developing a pollution prevention (P2) program to implement the regulatory mandates in the Pollution Prevention Act of 1990; Executive Order (E.O.) 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements; E.O. 12873 Federal Acquisition, Recycling, and Waste Prevention; and E.O. 12902 Energy Efficiency and Water Conservation at Federal Facilities. The Air Force P2 program incorporates the following principles in priority order:

- Generation of hazardous substances, pollutants, or contaminants will be reduced or eliminated at the source whenever feasible (source reduction).
- Pollution that cannot be prevented will be recycled in an environmentally safe manner.
- Disposal, or other releases to the environment, will be employed only as a last resort and will be conducted in an environmentally safe manner, according to regulatory guidance.

AFI 32-7080, dated 12 May 1994, provides the directive requirements for the Air Force P2 program. AFI 32-7080 incorporates by reference applicable Federal, DoD, and Air Force level regulations and directives for pollution prevention. Each installation incorporates the requirements of AFI 32-7080 into a Pollution Prevention Management Action Plan (P2 MAP). The P2 MAP is used to manage the actions needed to develop and execute an installation's P2 program. P2 MAPs are based on recurring opportunity assessments designed to continually evaluate an installation's success in achieving pollution prevention at the highest level in the hierarchy of action. The P2 MAP incorporates management strategies for meeting the goals of the program elements of the Air Force P2 program. These elements address reduction and elimination of ODS, EPA 17 industrial toxics, hazardous waste, solid waste, recyclable materials, and energy conservation.

Fort Richardson. The Army's P2 program is defined in PAM 200-1, Chapter 10, Pollution Prevention, and was also developed to comply with the Pollution Prevention Act of 1990 and E.O. 12856. The Army's P2 program within an installation consists of, but is not limited, to the following elements:

- A P2 management structure composed of a P2 coordinator, a steering group, and working teams;
- A baseline year (1994) and baseline tracking to determine reductions;
- Pollution Prevention Opportunity Assessments (PPOA) to identify processes where P2 can be applied;
- P2 goals as they relate to pollution reduction, mission, and management;
- Development and implementation of a P2 Plan;
- Training staff in P2 and awarding organizations for their contributions to the P2 program;
- Affirmative procurement that complies with the requirements of E.O. 13101 (purchase of designated materials containing recycled materials) and RCRA Section 6002 (purchase of materials that contain the highest percentage of recovered materials); and,
- Use of Alternative Fueled Vehicles in support of the Energy Policy Act of 1992.

3.6.4 Asbestos

Elmendorf AFB. Asbestos management at Air Force installations is established in AFI 32-1052, *Facility Asbestos Management*. AFI 32-1052 incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.140, Section 112 of the CAA, and other applicable AFIs and DoDDs. AFI 32-1052 requires installations to develop an asbestos management plan for the purposes of maintaining a permanent record of the current status and condition of all asbestos-containing material (ACM) in the installation facility inventory and documenting all asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan that details how the installation will conduct asbestos-related projects (USAF, 1994). Asbestos is regulated by the USEPA with the authority promulgated under the Occupational Safety and Health Act (OSHA), 29 U.S.C. §§ 669 et seq. Emissions of asbestos fibers to ambient air are regulated under Section 112 of the CAA.

Asbestos materials at the subject housing areas are addressed in accordance with the Elmendorf AFB Asbestos Management Plan (AMP). This plan is designed to protect personnel who live in military housing from exposure to airborne asbestos fibers. The plans specify the procedures for removal, encapsulation, and enclosure of ACM during repair of the units. The plans also ensure that MFH units remain in compliance with all federal, state, and local regulations pertaining to asbestos.

Ongoing asbestos surveys are conducted at the subject housing units before self-help projects are initiated by occupants or when suspect material is discovered. These surveys have indicated the presence of ACM, such as floor tiles and associated mastic, transite material, and other building materials containing asbestos.

According to Base personnel, all ACM at the Cherry Hill MFH area have been removed during housing renovation in the early 1980s. However, the other remaining five subject housing areas currently contain ACM (USAF, 2002b).

Fort Richardson. Asbestos management by the Army is covered in PAM 200-1, Chapter 8, Asbestos Management. This chapter further references Public Works Technical Bulletin (PWTB) 420-70-8, Installation Asbestos Management Program. The PWTB has been developed to comply with applicable parts of Title 29 and Title 40 of the CFR and requires installations to prepare and implement an Asbestos Management Plan. The technical bulletin also provides guidance in conducting asbestos surveys and assessment, selection of abatement alternatives, sampling for asbestos in building materials and for occupational exposures, and health, safety, and environmental considerations when conducting asbestos abatement.

Asbestos would not be expected to be found on the proposed property to be transferred to Elmendorf AFB because the site is undeveloped land.

3.6.5 Lead-Based Paint

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), was passed by Congress on October 28, 1992 and regulates the use and disposal of lead-based paint at federal facilities. Federal agencies are required to comply with all applicable federal, state, interstate, and local laws relating to lead-based paint activities and hazards.

Elmendorf AFB. Lead-based paint (LBP) management at Air Force installations is established in the Air Force policy and guidance on lead-based paint in facilities. The policy incorporates by reference the requirements of 29 CFR 1910.1025, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, Public Law 102-550, and other applicable federal regulations. This policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating lead-based paint hazards.

Lead-based paint is managed in accordance with the Elmendorf AFB Lead-Based Paint Management Plan. The objective of the plan is to minimize or eliminate exposure of the Base population to the possible detrimental effects of lead, especially within military family housing.

The testing and assessment of LBP on Elmendorf AFB is conducted on an as-needed basis. Based on the age of the buildings and results of testing, LBP is known to be present in the subject housing units, with the exception of Cherry Hill Housing. Based on discussions with Base personnel, all LBP has been removed from the housing units at Cherry Hill as part of the renovation activities conducted in the early 1980s. Due to the age of the buildings, the potential exists for lead in soil around the buildings from deteriorating LBP (USAF, 2002b).

Fort Richardson. The management of LBP at Army installations is covered under PAM 200-1, Chapter 4, Hazardous Materials Management, Section 4-6 (Lead Hazard Management). Fort Richardson has a LBP Management Plan. Lead-based paint would not be expected to be found on the undeveloped site on Fort Richardson.

3.6.6 Environmental Restoration Program

The Environmental Restoration Program (ERP), formerly known as the Installation Restoration Program (IRP), is a subcomponent of the Defense Environmental Restoration Program that became law under

SARA of 1986. The ERP requires each DoD installation to identify, investigate, and remediate environmental contamination that occurred prior to 1984. The ERP is the DoD program for implementing the requirements of CERCLA. The ERP follows the CERCLA process for potential hazardous sites. The ERP was developed to:

- Identify and evaluate hazardous material disposal sites;
- Control the migration of hazardous contaminants;
- Control hazards to health or welfare that may have resulted from past disposal operations; and,
- Clean up on a "worst first" basis, contamination from past hazardous waste sites at active military installations, government owned/contractor operated facilities, and used DoD sites.

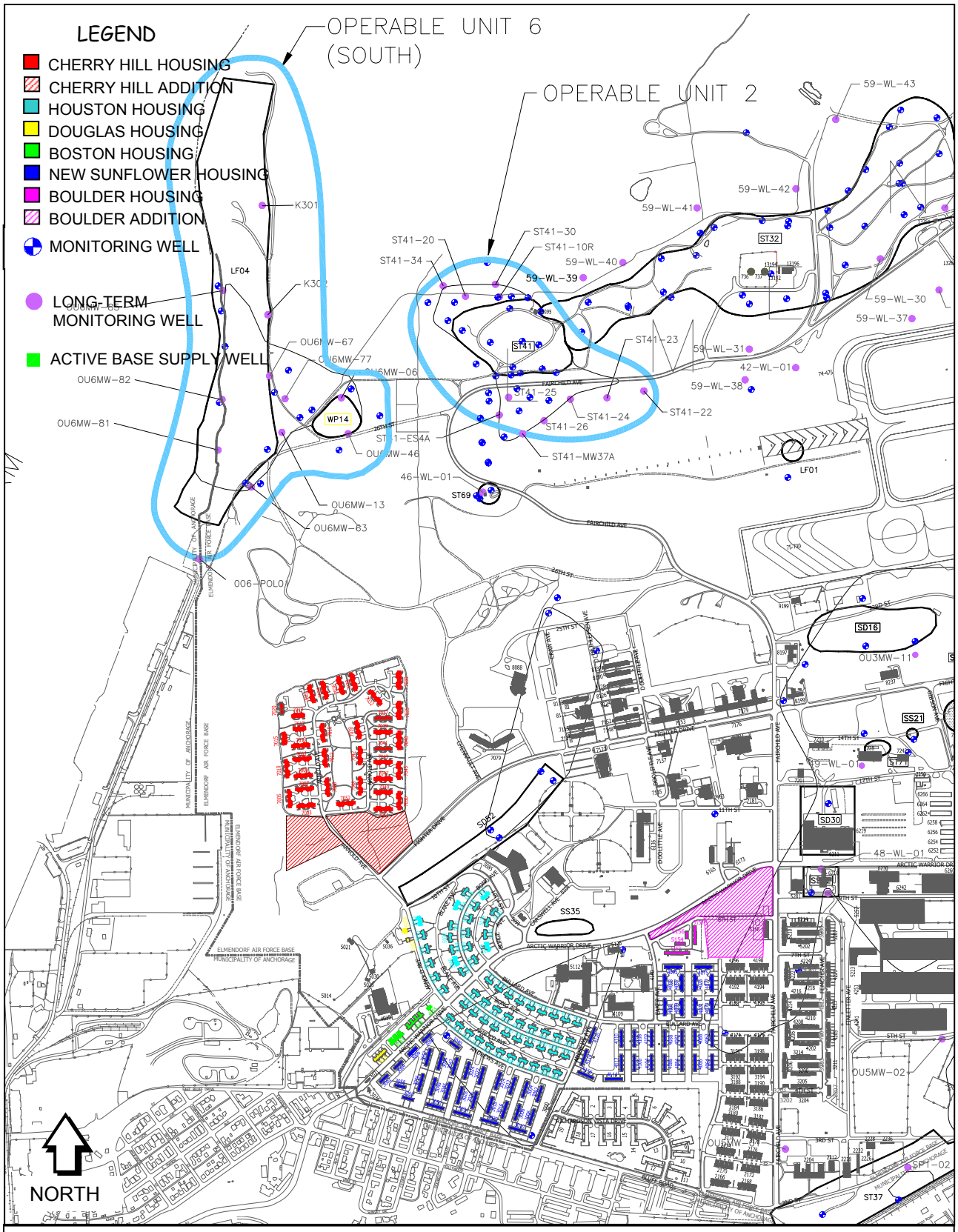
Elmendorf AFB. Historical industrial activities conducted at Elmendorf AFB resulted in contamination of groundwater beneath the Base, as well as soil contamination in site-specific areas. As a result, Elmendorf AFB was listed on the National Priority List (NPL) by the USEPA in August 1990. By placement on the NPL, the Base, as a Federal site, was subject to the remedial response requirements of CERCLA with regard to six identified Operable Units (OU) on Elmendorf AFB.

The shallow aquifer beneath the subject areas, as well beneath the majority of the Base, has been contaminated with petroleum, oil, and lubricant (POL) based products, metals, and volatile organic compounds (VOC). According to the MAP, contamination of the shallow groundwater is being addressed as part of OU5. Although source areas with the respective OU sites are not located within the MFH areas, three sites (SD52, SD30 and ST37) are located in proximity to the Government Hill Housing Area as shown on Figure 14. Contaminated sites managed as part of OU2, OU3 and OU5 are located in proximity to the Core Housing Area. SS53 is directly south of Dayton MFH as shown on Figure 15.

Before 1997, over twenty-seven 55-gallon drums were found in Cherry Hill Ravine, a natural drainage northwest of the Government Hill Gate, and in the outfall of Cherry Hill Ditch (south of Cherry Hill MFH). This site was known as Area of Concern (AOC) 97. Soil, sediments and surface water at the site were investigated to determine the concentration of diesel range organics and other contaminants of concern. Results of testing indicated that levels of contamination are below the Alaska Department of Environmental Conservation (ADEC) soil ingestion cleanup level. Elevated arsenic in the sediment is limited to one area within the ravine. It is unlikely that contaminants in sediment or seep water in the Cherry Hill Ravine poses an unacceptable risk, therefore, no further action is recommended (USAF, 2002d).

Remedial activities at the source areas have been completed, are ongoing, or will be implemented at each of the contaminated sites. Additional remedial activities include land use controls that restrict the use of the shallow aquifer for any purpose including, but not limited to, drinking, irrigation, fire control, dust control, or any other activity south of the Elmendorf Moraine. Ground, seep, and surface water are included in the Base water quality monitoring program.

Site-specific land use controls (LUC) have been established for sites where environmental contamination has been left in place. The Air Force has established a Land Use Controls Management Plan (USAF, 2003c), and uses LUCs to reduce the potential for exposure to hazardous substances or to enhance the protectiveness of a remedy. Nine areas on Elmendorf AFB, encompassing six OUs, are subject to LUCs. None of the site-specific LUCs are located on or near the Government Hill housing area (including the Cherry Hill MFH) or the Core housing area.



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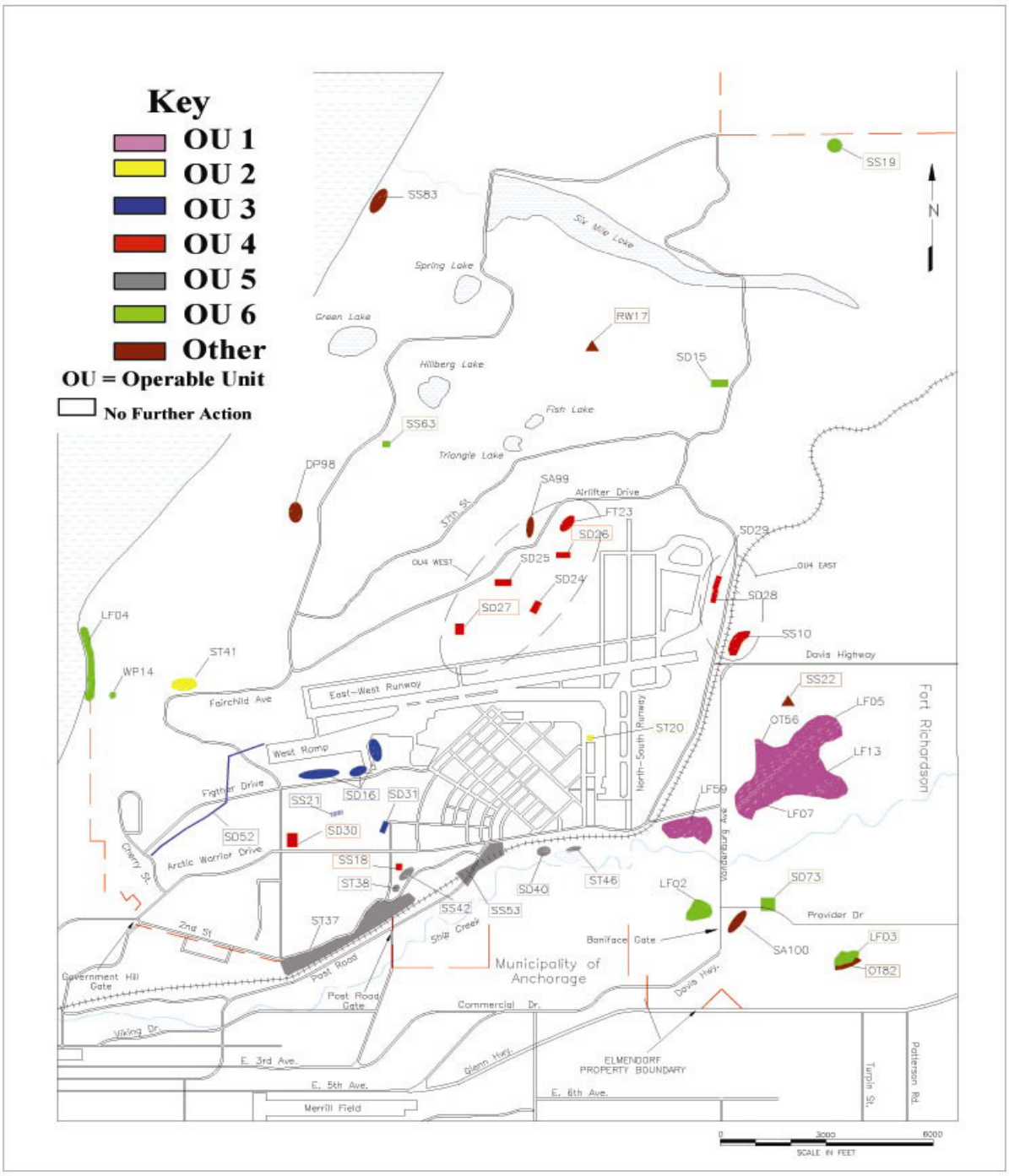
Approximate Scale in Feet

Figure 14
Contaminated Sites Located Near Government Hill Housing Area
Elmendorf AFB



CERCLA Sites Near Core Housing Area, Elmendorf AFB

Figure 15

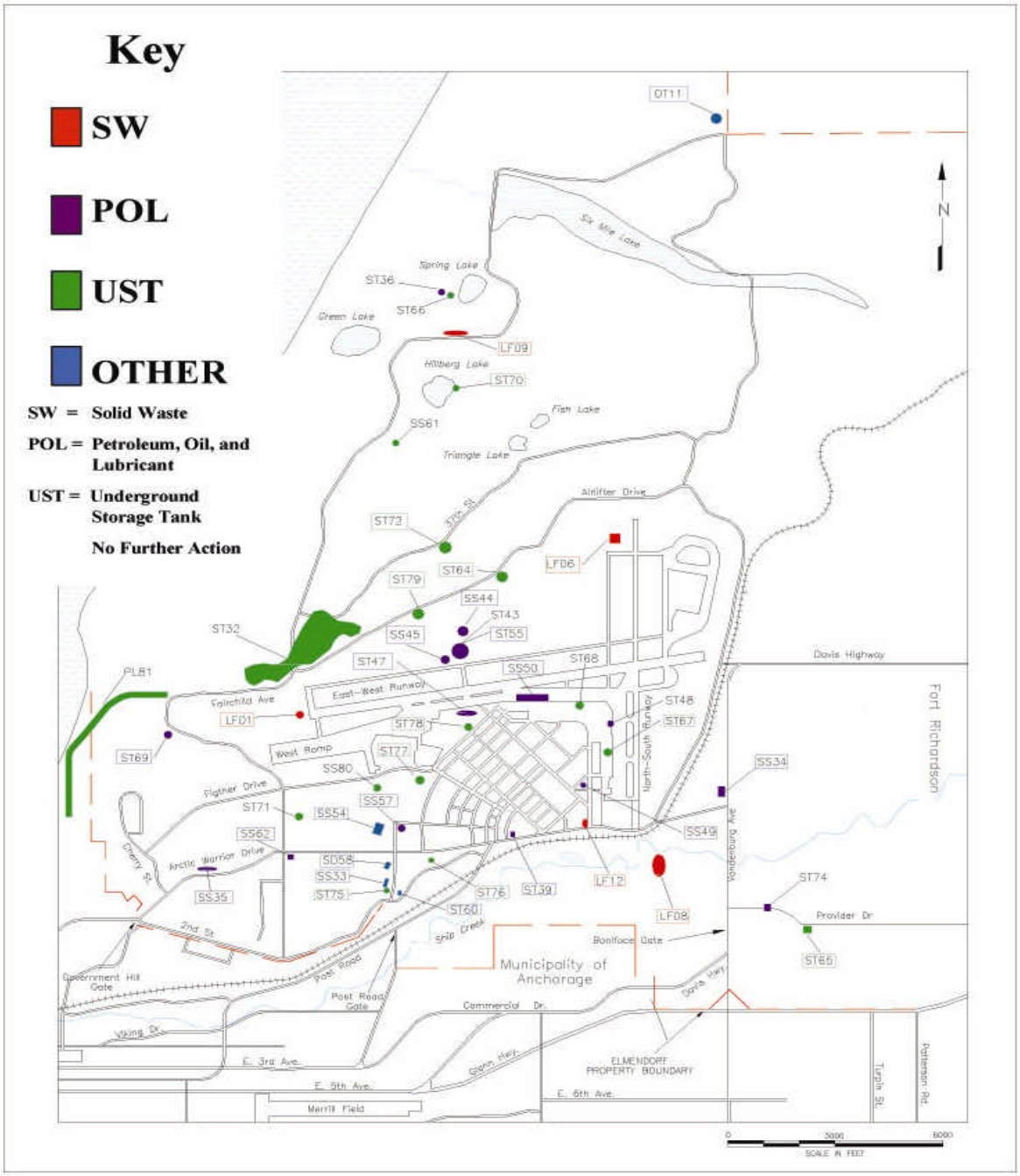
Non-CERCLA contaminated sites are addressed by the Air Force through the Alaska State-Elmendorf Environmental Restoration Agreement (SERA).[1] The SERA program addresses sites with petroleum contamination and allows for sites to be transferred to the CERCLA program if hazardous substances, (solvents, metals, or other non-petroleum compounds) are found. Although no SERA sites are in the subject areas, three POL sites (SS35, SS62 and ST39) are in proximity of housing areas as shown on Figures 14 and 16.

Identified SERA sites on the Base have been investigated and remedial activities at these sites have been completed, are ongoing, or will be implemented. In addition, an evaluation by the Air Force, USEPA, and ADEC has determined that remedial actions are protective of human health and the environment. Table 14 is a summary of the nature and status of these contaminated sites.

Table 14. CERCLA and SERA Sites Near the MFH Areas at Elmendorf AFB

Site	Description	Status
OU3 – SD52	Cherry Hill Ditch. Organic compounds, petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAH), and metals were present in the sediment and surface water samples. Polychlorinated biphenyls (PCB) left in place with a protective fabric barrier between the PCB and surface soil.	SD52 has been closed and no longer monitored. A No Further Action document was prepared.
OU4 – SD30	SD30 (Bldg 621, automotive maintenance facility) that generates used hydraulic fluid and engine oil, and used PD-680. The floor drains originally discharged fuels from minor spills and solvents to a dry well south of the building.	SD30 was closed in 1993.
OU5 – ST37 and SS53	ST37 is the site of a diesel fuel line leak exhibiting soil and groundwater contamination. Fly ash, a by-product of coal used by Elmendorf AFB power plants before the late 1960s, was also found. SS53 is located along Pease Avenue north of Ship Creek. For an unspecified number of years, a fuel seep of unknown origin was seen during spring breakup at SS53. The fuel seep appears to flow into a drainage ditch parallel to Pease Avenue. During a 1987 inspection, fuel was found in small holes dug in the ground, and fuel-stained soil was seen in the ditch. During 1988 and 1989 investigations, fuel was not found in the area.	A Record of Decision for OU5 was signed 1 Feb 95. Wetland construction at ST37 was completed in 1996. Groundwater natural attenuation is underway for this site.
ST39	ST39, located at the intersection of Second and F streets in the cantonment, was the site of a surface spill of less than 200 gallons of JP-4 jet fuel in 1962. In response to the spill, the top one-half foot of contaminated peat and topsoil was removed and placed in the base landfill (LF07). Records indicate that the majority of contamination was removed from the site in the excavated soil. No contamination of surface waters occurred at the time of the spill.	Of the 14 POL spill source areas included in the state POL program, ST39 was approved for NFA.
SS35	Paxson Park Site, bordered by fire station, Mt. Illiamna School, Orion Elementary School, Aurora School, Bldg 5091 and park pavilion. Former military housing complex. POL odor and oil-soaked soil found in 1988. The source(s) have not been determined.	This SERA Phase I source area has been closed.
SS62	Army/Air Force Exchange Service (AAFES) service station, bordered by Bldg 6210, car wash, vehicle maintenance shop (Bldg 6211), paved parking lot and Bldg 6230, and Shopette (Bldg 5201). All seven USTs were removed in 1991, and five replacement USTs installed. Contaminated soil around the waste oil USTs was removed to 18 feet (depth limit of the backhoe). Contaminated soils remained because of the limitations of the backhoe. Laboratory analysis of the waste oil contaminated soil indicated detectable levels of PCB and TCE.	This SERA Phase I source area has been closed.

[1] SERA was developed in October 1992 as a cooperative agreement with ADEC. SERA was dissolved on October 21, 2002 by mutual agreement. It is understood that the sites and programs formerly addressed by SERA, underground storage tanks and oil and other hazardous substance discharges, are managed in accordance with 18 AAC 78 and 18 AAC 75.



SERA Program Sites Near Core Housing Area, Elmendorf AFB

Figure 16

Fort Richardson. Fort Richardson was listed on the NPL by the USEPA in 1994. By its listing on the NPL, the Post, as a Federal site, was subject to the remedial response requirements of CERCLA. In December 1994, the Army, USEPA and the Alaska Department of Conservation (ADEC) signed a Federal Facilities Agreement (FFA) where four designated OU areas have been identified at the Post. None of these OUs are within a mile of the Fort Richardson property to be transferred to Elmendorf AFB.

Buildings 35610 and 35620 are Two-Party Agreement sites between the Army and the State of Alaska. The Two-Party Agreement is two separate agreements which focus on source areas at Fort Richardson contaminated with petroleum from underground storage tanks (UST) and petroleum source areas not associated with USTs. The Two-Party Agreement is also known as the State-Fort Richardson Environmental Restoration Agreement. Two-Party Agreement sites are not included in the work being conducted under CERCLA. Two-Party Agreements guide the way in which the Army performs necessary site assessments, monitoring, remediation, and closure of POL-contaminated source areas not subject to CERCLA oversight.

Buildings 35610 and 35620 are freshwater pump stations located on the Fort Richardson property. A 600-gallon heating oil tank is located at each building; the tanks were removed and replaced in 1996. Site assessments conducted at the time of tank removal indicated that diesel contamination was present in the soil, and a release investigation was subsequently conducted. During 1999, petroleum-contaminated soils were excavated and thermally remediated off-site. Remediated soil was returned to the site and used as backfill. After the source removals were complete, the Army monitored the sites for several years to confirm that fuel contamination in groundwater was below ADEC cleanup levels. The contaminated sites have been cleaned up and the sites closed, requiring no further remedial action (USAG, 2004).

Although the underlying lands would be transferred to the administrative control of the Air Force, the Army will retain, through easement, the portion of the property where the pump houses are located and where prior petroleum releases occurred. This land will remain under control of the Army and will not be available for future development. The instrument for transfer of property will include a notification stipulating that petroleum is currently stored on the property and that prior releases of petroleum have been documented on the site (USAG, 2004).

3.6.7 Pesticides

Elmendorf AFB. The 3rd CES Pest Management section is responsible for vertebrate and invertebrate pests as well as weed and insect control on Elmendorf AFB, and is accomplished in accordance with the Integrated Pest Management Plan (USAF, 2000). Pesticides, herbicides, and other similar chemicals have been used for the purpose of maintaining landscaped areas within the MFH areas on Elmendorf AFB. Minimal application of herbicides has been performed at the housing areas. When these types of chemicals have been used, their applications have been conducted in accordance with manufacturer's specifications, and have been applied by personnel properly trained in their use. No evidence of bulk storage of pesticides, herbicides, and other similar chemicals has been found at Elmendorf AFB (USAF, 2002b).

Fort Richardson. AR 200-5, Pest Management, defines the Army's Integrated Pest Management program, requires the preparation of the Installation Pest Management Plan, and provides specific requirements for personnel training, recordkeeping and reporting, procurement, design of pesticide storage facilities, handling and application of pesticides, disposal of unused pesticides, contingency and readiness, health and safety, contracting, and self-help.

Fort Richardson has prepared an Installation Pest Management Plan that identifies pesticide reduction and basic training certification of Army pest control personnel. The plan includes chemical use (restricted to USEPA-approved chemicals), pesticide certification, invasive and exotic plant control, wildlife conflicts, domestic pets, insects and small mammals, beavers, moose, bears, cliff swallows, predator control, other animals, injured animals and Bird-Aircraft Strike Hazard (BASH) Management.

The proposed housing site on Fort Richardson is primarily undeveloped land and pesticides are not believed to have been applied in past years. The proposed housing site was formerly a communications site with approximately 20 antennas erected on 421 acres. Soil sterilizers have been used in the existing antenna field north of Ship Creek adjacent to the proposed housing site to control vegetation under the antennas. There are no records to show if pesticides were used in the old antenna field south of Ship Creek (the proposed housing site).

3.6.8 Radon

The USEPA has categorized Anchorage County as Zone 2 for radon. Zone 2 are areas with indoor average radon levels of greater than or equal to 2 picoCuries per liter (pCi/L), but less than or equal to 4 pCi/L. The current USEPA recommended action level (RAL) for radon is 4 pCi/L.

Elmendorf AFB. Radon testing was conducted at MFH units on Elmendorf AFB in the 1980s. Results of the testing did not indicate levels above the RAL (USAF, 2002b).

Fort Richardson. The Army conducted an extensive Radon Assessment Program in the 1990s and the results indicate that indoor radon is not a problem in the majority of Army structures tested.

3.6.9 Polychlorinated Biphenyls

Elmendorf AFB. Elmendorf AFB has been classified as polychlorinated biphenyl (PCB)-free by the Air Force. This classification indicates that all electrical equipment, with the exception of mission-critical equipment, containing equal to or greater than 50 parts per million (ppm) of PCB has been removed from the Base. Electrical equipment, such as transformers, have been tested, and refilled with dielectric fluid containing less than 50 ppm of PCB.

Several pole- and concreted pad-mounted electrical transformers are present in the MFH areas. Obvious stains and/or leaks were not observed around these transformers. Fluorescent lights are also present in the housing units. Ballasts normally associated with fluorescent lights may contain PCB. Obvious stains and/or leaks were not observed in the fluorescent lights fixtures (USAF, 2002b).

Fort Richardson. The Army addresses PCB management in PAM 200-1, Chapter 4, Section 4-4, Polychlorinated Biphenyl Management. The requirements of this section are consistent with the requirements of 40 CFR 761.

3.6.10 Underground Storage Tanks

Elmendorf AFB. No underground storage tanks are located near the Government Hill Housing Area, while SERA Program sites associated with USTs are located in the area surrounding the Core Housing Area (Figure 16).

Fort Richardson. Based on available documents, historical use of the site, and interviews with knowledgeable personnel, no underground storage tanks are located on the property to be transferred from Fort Richardson. One 300-gallon aboveground diesel storage tank is located at Pump House Bldg 35-630 on the proposed housing site.

3.7 BIOLOGICAL RESOURCES

3.7.1 Vegetation

Elmendorf AFB. Natural vegetation in the Elmendorf AFB region is a transition between the Pacific Coast, western hemlock-sitka spruce forest and the interior boreal forests of white spruce, paper birch, and aspen. The species associations of forests on Elmendorf AFB are similar to the interior of Alaska, but are less modified by fire due to the wetter maritime climate of the area. Of the 476 species of vascular

plants known to occur in the Anchorage area, 221 are found on the Base. Two major lichens and 13 mosses have also been identified on Elmendorf AFB (USAF, 2000).

Elmendorf AFB is characterized by nine vegetation classes: forest, dwarf tree, tall shrub, low shrub, moss, sedge-grass, rooted floating aquatic, coastal mud and open water. A total of 26 vegetation types are present and include open- and closed-needle leaf and broadleaf forest, broadleaf woodland, open and closed mixed forest, mixed woodland, and tree shrub woodland, wet forb, and herbaceous. Forest vegetation types include mixed spruce hardwood, white spruce, black spruce, paper birch, quaking aspen, cottonwood and balsam poplar and ground cover. Among the vegetation found on upland sites at Elmendorf AFB are old growth stands of paper birch and white spruce, and cottonwood and cottonwood-aspen mixes on lowland old growth sites. Vegetation types, including forest vegetation, are found primarily in the northern two-thirds and eastern portions of the Base (USAF, 2000).

The main cantonment area, where MFH areas are located, are considered to be disturbed areas and are currently managed as lawn or “let grow habitat” that meets BASH vegetation management restrictions. Other disturbed areas around the cantonment area have grown back into stands of poplar, alder and Canadian blue-joint grass. Vegetation within the existing housing areas is landscaped and contains limited numbers of mature trees.

Vegetation is present on the undeveloped areas adjacent to existing housing:

- The 12.7-acre Cherry Hill site includes two areas on either side of Arnold Avenue south of the Cherry Hill MFH area. The sites are sparsely wooded open spaces area with unpaved roadways on both parcels used possibly for maintenance of the steam line equipment present on the eastern parcel. The sites are fairly disturbed and contain alder and blue joint grass as the predominant vegetation. The west and east hillsides of Cherry Hill MFH area are approximately 20 acres of wooded area.

- The 11.02-acre site adjacent to Boulder MFH area is disturbed area with primarily grassy areas and isolated trees. The area is located between unaccompanied housing and Base support facilities (including Bldg 5188, Airman’s Attic/Bargain Shop), and is also used for recreation and open space.

- The 5.27-acre open space/playground area west of the FO/CO housing is a mowed, grassy field with limited conifer species along its periphery.

Fort Richardson. The installation is topographically diverse with vegetation communities that include coastal salt marshes, alpine tundra, shrublands, snowbeds and meadows. Five zones of vegetation and plant habitats are present on Fort Richardson: coastal halophytic zone, lowland interior forest zone, subalpine zone, alpine zone and artificially cleared or disturbed zone.

Based on vegetation mapping conducted in 1998 (USARAK, 2001a), the vegetation on the proposed site to be transferred to Elmendorf AFB is characterized by dry forb herbaceous, ericaceous dwarf scrub, closed needleleaf forest, open needle leaf forest, disturbed areas and unmapped areas.

Eight forest types are found on Fort Richardson: white spruce, paper birch, quaking aspen, cottonwood and balsam Poplar, black spruce, mixed spruce-hardwood, and brush. Fort Richardson does not have a significant market for forest products.

The primary forest insect problem on Fort Richardson is spruce bark beetle (*Dendroctonus rufipennis*) which affects white spruce trees greater than six inches in diameter. Black spruce is rarely attacked and mature forests are most susceptible. Spruce bark beetle infestations may result in invasion by bluejoint grass, a native perennial. Forest vegetation on Fort Richardson is also infected with a fungus called heart rot, particularly in mature birch stands (USARAK, 2001a).

As discussed in Subchapter 3.3.2, the proposed site to be transferred to Elmendorf AFB is located on protected forest. Forest management activities, including timber removal activities or stand improvement/regeneration, are not planned for this site.

The proposed site to be transferred to Elmendorf AFB north of Bartlett High School was mature interior forest originally before it was cleared in 1973 for the construction of an Air Force antenna field and Communications Site. The antennas and communications system was originally constructed on both sides of Ship Creek. In the 1980s, the part of the antennas and communications system south of Ship Creek was deactivated. The antennas were removed and the land has been managed primarily for winter moose habitat. The focus has been to promote early successional hardwood vegetative growth by mechanical manipulation. This was accomplished by recycling older unproductive and over grown vegetation by a rotary ax.

The proposed site to be transferred to Elmendorf AFB is now a forested area that consists of mature spruce and aspen with browsed willows in the understory in and around small clearings. The area north of Bartlett High School includes a clearing containing two distinctly managed areas:

- One area appears to have been cut to the ground during 2002 to 2003, and exhibits a dense uniform stand of willow and aspen growing to heights of 2 to 3 ft.

- The second area consists of a mixed age stand that may have either been partially cleared or heavily browsed by moose. Mosses, grass and forbs completely cover the ground beneath the willow and aspen. Minor woody species include spruce, alter, birch and blueberry. Groundcover is composed of moss, kinnickinick, bunchberry dogwood, lupine, fireweed and bog cranberry (USAF, 2003e).

3.7.2 Wildlife

Elmendorf AFB. A variety of wildlife is found on Elmendorf AFB including 29 mammals, 112 birds and 10 fish species. Large mammals include moose, black and brown bears, and wolves. Small mammals include species of furbearers, hare, squirrel, vole, shrew, and bat. Birds found on Elmendorf AFB include waterfowl, shorebirds, raptors, passerines and other small birds. No reptiles are known to occur on the Base, and one species of amphibian (wood frog) is common in bogs and wetlands. A list of vertebrate species occurring on Elmendorf AFB is included in Appendix F of the INRMP (USAF, 2000).

The main cantonment area of Elmendorf AFB is dominated by the airfield, supporting buildings, housing and recreational areas. This area has few natural areas remaining and provides limited habitat for wildlife due to development. The remaining pockets of natural areas are important in reducing human/animal conflicts and providing areas of retreat for wildlife. This area is within the Bird Exclusion Zone (BEZ) and requires that open spaces be managed to minimize attraction to geese and other large birds. Large open lawn areas are an attraction for geese and moose. Forbs and grasses unattractive to geese are encouraged and, if necessary, mowed at a height no shorter than 10 inches. Interspersed shrubs and trees also serve to discourage use by geese. These semi-wild open spaces, however, attract small mammals (i.e., voles) and ground nesting songbirds such as savannah sparrows. These areas also serve as feeding areas for fox, coyote, raptors, and gulls when vole and grasshopper populations are high.

Wildlife that would be anticipated at the two undeveloped areas proposed for housing construction is described as follows:

- The area surrounding Cherry Hill MFH may serve as habitat for large and small mammals, and a variety of birds, that forage in this fairly isolated location. The presence of moose calves around the housing area, as well as garbage and unsecured human and pet food, has the potential to attract brown bears. The shrub and forest surrounding this site attract moose year-round but primarily in the fall. Calving can occur in the area as does breeding and wintering. Landscape vegetation at the site is attractive to moose. This vegetation and the tendency for moose to search out available food

sources are responsible for moose-human interaction rates higher than most other housing locations on Elmendorf AFB during the fall. Some of the interactions develop into conflicts. However, the more serious wildlife-human conflicts at Cherry Hill MFH are caused by black bears that frequent the site to take advantage of garbage, human food, and pet food during summer. The dense surrounding vegetation and the thickly vegetated slopes above Knik Arm to the west of the area serve as attractive cover for bears. Denning is suspected to occur near Cherry Hill MFH.

- Limited wildlife would be expected to visit the Boulder Addition site. While habitat is marginal (for mammals), voles, shrews and house mice can occur and, thus, attract fox and coyotes. Pet food and garbage also serve to attract fox, coyotes and bears. Landscape ornamentals attract moose as do re-seeded lawn areas. The most commonly observed bird species include black-billed magpie, raven, American robin, Bohemian waxwings, black-capped chickadees and dark-eyed juncos.

The construction of security fencing on Elmendorf AFB has resulted in the elimination of portions of habitat for large mammals through exclusion. Security fencing that surrounds the runway minimizes moose-aircraft conflicts. However, security fences in other areas (i.e., east of the DoD/VA Hospital) has resulted in separation of cows and calves, and disruption to historical movement patterns. This has resulted in incidents of moose traveling through Base gates and moose-human conflicts.

Fort Richardson. With the exception of mountain species, wildlife on Fort Richardson is similar to Elmendorf AFB. Wildlife found on Fort Richardson includes large and small mammals, birds, fish and amphibians. Mammals found on the installation include moose, brown bear, black bear, Dall sheep, coyote, wolf, lynx, red squirrel, snowshoe hare, hoary marmot, marten, beaver, river otter, wolverine, red fox, porcupine and mink. Over 150 species of birds are reported from Fort Richardson. Ten species of fish, including five species of salmon, are found in the lakes and waterways on Fort Richardson. A listing of fauna occurring on Fort Richardson is included in Appendix F of the installation INRMP (USARAK, 2001a).

A fish hatchery is located on Ship Creek northeast of the proposed site to be transferred to the Air Force. An active bald eagle nest is located near Ship Creek north of the project area. The location of the proposed site is shown on Figure 17.

Fort Richardson has the largest concentration of wintering moose in the Anchorage urban area. During the 17-year period from 1986 to 2003, the moose population on Fort Richardson has averaged 510 animals. Fort Richardson and the Alaska Department of Fish and Game manage the moose population through regulated annual moose hunts and improvement of moose browse and the clearing and rehabilitation of areas for preferred plant species. Early successional species such as birch, aspen and willow provide excellent moose habitat. Active moose habitat is managed utilizing a Hydro-Ax™ to clear mature brush and promote regeneration of browse. This method has generally helped to increase the food supply, although some areas are heavily overbrowsed (USARAK, 2001a). Overbrowsing is presumed to be a factor contributing to winter moose mortality.

The property that would be transferred to Elmendorf AFB is composed of three types of wildlife habitat: needleleaf forest, broadleaf forest and areas modified by humans. A variety of mammals and bird species utilize these habitat types. Moose utilize a variety of habitat types, but the critical habitat is regenerating broadleaf forests created through intentional manipulation or as a result of disturbance by man. The browse provided by this habitat is very important to moose winter survival.

The property that would be transferred to Elmendorf AFB is located entirely in an area considered to be important moose winter range within the central and south portions of Fort Richardson. It is estimated that a resident population of 140 moose is supported in this portion of the Base, with a population of over 200 resident and migratory moose occurring in mid- to late-winter.

The subject property is located in the area known as the antenna field situated between the cantonments of Elmendorf AFB and Fort Richardson. The antenna field habitat, bisected by Ship Creek, is crucial to the health and sustainability of the moose population in the southern-central portion of Fort Richardson.

This area is surveyed for moose by the Alaska Department of Fish and Game and Fort Richardson on an annual basis using fixed-wing aircraft. The proposed site for MFH is located within Survey Unit 8. This survey unit has supported an estimated average of 48 moose over the period 1991 through 2003, based on annual surveys. This number represents the resident moose found in this area in the early winter. Within the antenna field area bisected by Ship Creek, a total of 14 moose are estimated to occur in the 421 acres of land south of Ship Creek (Quirk, 2003).

In 1996, the Joint DOD/VA Hospital was constructed immediately southwest of the site on a 60-acre tract of land. To compensate for loss of habitat, approximately 25 acres of overgrown habitat (in the antenna field and south of Ship Creek) was recycled to develop moose browse. This property is exhibiting the effects of moose overbrowsing.

Elmendorf AFB and Fort Richardson biologists, in coordination with Alaska Department of Fish and Game, have identified in excess of 300 acres of land that can be enhanced and managed as future moose habitat. These areas are prioritized by proximity and expected future value to moose. Due to different vegetation type and structure at each potential site, different treatments would be necessary to achieve ideal moose habitat. The overriding goal is long-term stability of the moose habitat by land restriction or designation.

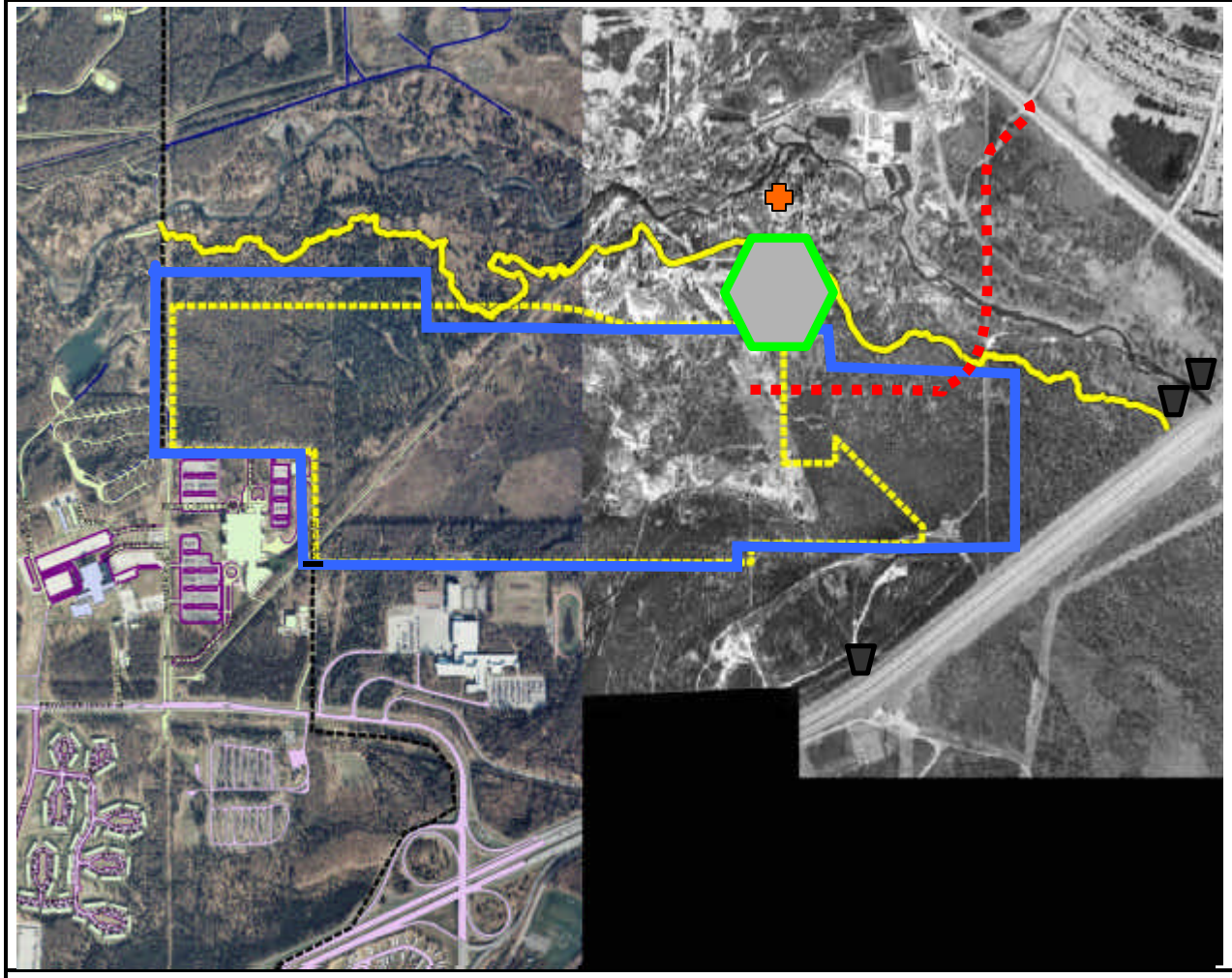
As part of its ongoing conservation effort, the Air Force is planning to construct evapotranspiration landfill covers that incorporate soil amendments and a vegetation mix that should provide desirable moose browse. A preliminary total of approximately 56 acres of landfills to be closed on Elmendorf AFB have been identified in the 2003 Evapotranspiration Landfill Cover Feasibility Study (USAF, 2003e).

The subject property provides habitat and an important travel corridor for bears. Black bears potentially den within the 352 acres. Large, hollow black cottonwood trees are frequently used by black bears for denning as an alternative to dug dens. This type of tree is common along the Ship Creek riparian zone (outside the subject property).

Bear feeding opportunities and attractions also exist in the subject area. In addition to vegetation commonly consumed by bears, both black and brown bears will take advantage of young moose calves which are common in early summer within the site. If future management of the Ship Creek fishery allows for the upstream escapement and spawning of salmon, both species of bear will have a strong attraction to the area for feeding. Currently, only a rare salmon escapes above the Elmendorf fish hatchery dam to make its run upstream to spawn. Several local groups and activist are strongly encouraging state managers to facilitate the passage of salmon up Ship Creek to produce a more natural system. As evidence to the potential attraction by this new run of salmon, Cottonwood Park, east of Ship Creek and the subject property, is frequently visited by black bears seeking food from picnickers and garbage receptacles.

The Glenn Highway wildlife underpass at Ship Creek makes the Ship Creek riparian zone an important bear travel corridor. Bears likely use the corridor to travel between both sides of the highway. The thick undergrowth along the creek provides bears a secure area to travel, rest, feed or access nearby food sources.

The high potential and current frequency for bear-human conflicts in the Anchorage Municipality, which includes Elmendorf AFB and Fort Richardson, prompted the formation of the Anchorage Bear Committee. The committee is made up of biologists and land management representatives from the state, municipality, military installations and interested citizens. The committee's goal is to develop an urban bear management plan that includes bear awareness by the public, waste management practices that minimize the creation of bear attractants, and identification and protection of important bear habitat and travel corridors. As participants in the committee, the Air Force will likely sign on to enact the plan on Air Force lands.



Former Site Boundaries

100-year Stream Bank

Proposed Housing Area (344 acres)

Proposed Access Road and Bridge

Active Eagle Nest

Hatchery Well Field

Glenn Highway Moose Gates

Wildlife Resources on Fort Richardson Property
Figure 17

3.7.3 Threatened and Endangered Species

Elmendorf AFB. No federally listed threatened or endangered species are known to exist on Elmendorf AFB. The former threatened peregrine falcon (*Falco peregrinus anatum*), delisted in 1999, is known to over-fly the areas during migration and has been verified at Eagle River Flats. No known nesting sites have been found on the Base. The formerly threatened bald eagle (*Haliaeetus leucocephalus)* is a locally common species protected under the federal Bald Eagle Protection Act and state law. The Canada lynx (*Lynx canadensis*) has been listed as threatened in the Lower 48 states. The lynx, a common furbearer in Alaska, is generally considered to be cyclic, following the cyclic high and low populations of showshoe hare, its primary prey species. When snowshoe hare are abundant on Fort Richardson and Elmendorf AFB, lynx can be common.

State of Alaska Species of Concern that occur on Elmendorf AFB include five species of birds. The habitat of each of these species is described in Table 15. None of the Alaska Species of Concern shown on Table 15 nest within the Main Cantonment Area of Elmendorf AFB but they may visit trees and shrubs in the housing areas as they pass through during migration. The olive-sided flycatcher and blackpoll warbler are nesters in appropriate habitat on Elmendorf AFB and Fort Richardson. The proposed housing area may provide marginal habitat for the blackpoll warbler. Proposed moose habitat replacement sites that include stands of black spruce may provide nesting habitat for the olive-sided flycatcher.

Table 15. Alaska Species of Concern at Elmendorf AFB

Common Name	Scientific Name	Habitat
Olive-sided flycatcher	*Contopus cooperi*	Coniferous forests and forested wetlands. Nests in conifers. Recorded as uncommon breeder during summer 2003.
Gray-cheeked thrush	*Catharus minimus*	Mixed deciduous-coniferous woodlands, shrub thickets, coniferous forests. Forages for food in open areas near thickets and on the tundra. Nests in bushes or low trees. Not recorded as nester on Elmendorf AFB
Townsend's warbler	*Dendroica townsendi*	Coniferous forests, mixed deciduous-coniferous woodlands. Rare migrant on the Base.
Blackpoll warbler	*Dendroica striata*	Coniferous forests, mixed deciduous-coniferous woodlands, shrub thickets. Nests in small conifers or on the ground under conifers. Recorded as uncommon breeder during summer 2003.
American peregrine falcon	*Falco peregrinus anatum*	Open country, especially shores in marshes frequented by waterfowl and shorebirds, as well as cliffs on the islands, along the coast and in the mountains. Nests on cliff edges. Migrates through the Elmendorf AFB area.

Source: USAF, 2001a; Griese, 2004

The Elmendorf AFB Integrated Natural Resources Management Plan identifies species of special interest on the Base. In addition to threatened and endangered species, a number of key species have been identified. Key (or keystone) species are indicator species whose populations and health can be used as indications of overall ecosystem health. On Elmendorf AFB, moose and snowshoe hare are key species for terrestrial habitats in the boreal forest ecosystem. Key species for wetlands are beaver and selected passerines. Plant indicator species in wetland ecosystems include willow, alder, devil's club and early seral stages of aspen (USAF, 2000).

Fort Richardson. Two plant species on the federal endangered list occur in Alaska, neither of which is found on Fort Richardson. One former candidate category 2 species, *Taraxacum carneocoloratum*, has been found in alpine areas of the Chugach Mountains. A total of 22 vascular plant species of concern are

known to occur on Fort Richardson. Many of these species are alpine natives and would be expected to occur on the southern portion of the installation.

No federally listed threatened or endangered wildlife species inhabit Fort Richardson. The peregrine falcon is known to pass through the area. The bald eagle (*Haliaeetus leucocephalus*), a threatened species in other states, is afforded special protection under the Bald Eagle Protection Act. This species is common on Fort Richardson. Trumpeter swan (*Cygnus buccinator*) and golden eagle (*Aquila chrysaetos*) are of special concern for wildlife management on Fort Richardson. Trumpeter swan is the world's largest waterfowl species and a migrant on the installation. The golden eagle is a resident of alpine habitats on Fort Richardson (USARAK, 2001a).

3.7.4 Wetlands

Executive Order 11900 (Protection of Wetlands) defines jurisdictional wetlands to generally include swamps, bogs and similar areas such as sloughs, mud flats and natural ponds that are inundated by surface or groundwater with a frequency sufficient to support prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Permanent water such as streams, reservoirs and deep lakes are not considered to be wetlands.

Elmendorf AFB. Wetlands on Elmendorf AFB include freshwater marshes, bogs, lakes and ponds, and riparian areas. Wetland vegetation types include open water, emergent vegetation, aquatic bed, and shrubs. Wet herbaceous forbs, mesic and wet graminoid forbs, bryoid moss and freshwater aquatic herbaceous plants are the wetland types found on the Base. A total of 1,537 acres of wetlands, lakes and ponds are present on Elmendorf AFB (USAF, 1998b).

Many of the numerous wetlands on Elmendorf AFB are less than one acre in size and occur on the Base's moraine areas. Spring and early-summer are the dominant wet period for wetlands. As shown on Figure 17, isolated wetlands are found approximately 500 feet from the Cherry Hill MFH area.

Fort Richardson. Freshwater and saltwater marshes, bogs, lakes and lake margins and riparian areas are found on Fort Richardson. Wetlands on Fort Richardson have not been formally delineated as jurisdictional wetlands as defined the Section 404 of the Clean Water Act. National Wetlands Inventory (NWI) mapping of Fort Richardson was completed in 1978 and revised in 1996. Wetlands associated with Ship Creek are found north of the proposed site to be transferred to the Air Force. The proposed road to be constructed would cross wetlands associated with Ship Creek.

The Army has prepared a Wetlands Management Plan that includes an environmental limitations overlay for summer and winter land use. The designations indicate significant or minor limitations of activities that will be allowed in training areas on Fort Richardson. The Ship Creek corridor is designated in the Wetlands Management Plan as having significant limitations or restrictions. Notification to the Army Range Control for use of this area is required, limitations are imposed on stream crossings, and construction activities are restricted. The proposed site to be transferred to the Air Force is located south of Ship Creek, and the proposed road to be constructed would require crossing of Ship Creek.

The Ship Creek Riparian Area is a special interest management area that is considered an important or fragile natural area. This area was identified in the INRMP because it warrants special conservation efforts, in accordance with AR 200-3. The Ship Creek Riparian Area is an approximately 0.5-kilometer corridor along the course of Ship Creek that spans Fort Richardson. Ship Creek and its riparian habitat are important and sensitive areas that require protection to insure maintenance of its health and natural function. Water quality of Ship Creek is important because any deterioration will affect downstream locations. Development is not planned to occur in riparian areas. Tree cutting will be prohibited. Troops and other authorized users will continue to have pass-through access (USARAK, 2001a).

3.7.5 Floodplains

As defined in Executive Order 11988 (Flood Plain Management), floodplains are lowland and relatively flat areas adjoining inland and coastal water that would be inundated by a 100-year flood. Federal agencies are required to reduce the risk of flood loss to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains.

Elmendorf AFB. The only 100-year floodplain on Elmendorf AFB is associated with Ship Creek, a tributary of the Knik Arm that flows along the southern boundary of the installation from its headwaters in the Chugach Mountains. The Ship Creek 100-year flood plain travels through approximately four miles of the Base and drains approximately 5,000 acres. This drainage area is located southeast of the MFH areas (see Figure 18). In recent years, this area has flooded resulting in damage to stream channelization structures near the golf course. Ship Creek has not experienced a 50-year flood since 1990 (USAF, 1998b)

Fort Richardson. The floodplain associated with Ship Creek is presumed to extend to Fort Richardson across approximately 15 miles of the installation. The proposed site to be transferred to the Air Force abuts the 100-year stream bank (Figure 17). The proposed road to be constructed would include a bridge over Ship Creek that would traverse the 100-year floodplain.

3.8 CULTURAL RESOURCES

Cultural resources are defined as any historic, archaeological and Native American properties of interest or artifacts (USAF, 1994). Historic properties, under 36 CFR 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places" (NRHP). The term "eligible for inclusion in the National Register" includes both listed and eligible properties that meet NRHP listing criteria as found in 36 CFR Part 60.

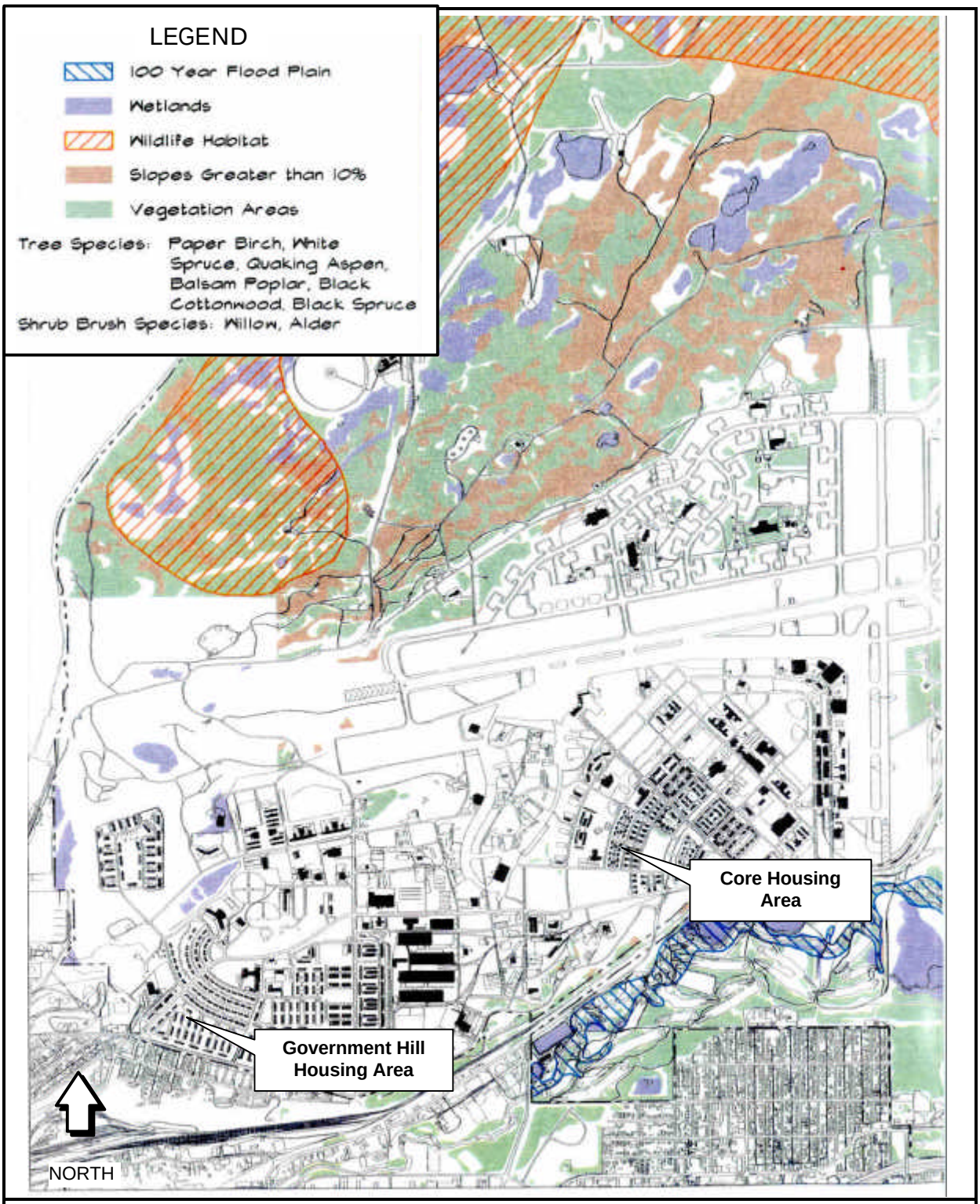
Elmendorf AFB. The Air Force has prepared an Integrated Cultural Resources Management Plan (ICRMP) for Elmendorf AFB as part of the Base General Plan. The five-year plan, for fiscal years 2002 through 2006, provides for effective management of cultural resources on the Base (USAF, 2003d).

Fort Richardson. The Army has prepared an Integrated Cultural Resources Management Plan for Fort Richardson for 2002 through 2006. The plan provides guidance and procedures to enable USARAK to meet its legal responsibilities at Fort Richardson for identification, evaluation and protection of cultural resources while causing the least disturbance to the military mission (USARAK, 2001b).

3.8.1 Archaeological Resources

Elmendorf AFB. A total of 27 archaeological sites have been identified on Elmendorf AFB property. These sites include concrete bunkers and pits, military defensive sites, homesteader cabin remains, possible Native Alaskan/traditional cache pits, military ground defensive positions, a borrow pit/landfill and a rail spur. Four of these sites (homesteader or log cabin ruins) were recommended for further archaeological study to determine their eligibility for the National Register, and are considered potentially eligible for listing. Six other sites appear to be ineligible although further archival study was recommended (USAF, 2003d). None of the 27 known sites are located in or near the Government Hill or Core housing areas.

An archaeological site, ANC-760, is approximately 75 feet west of the boundary of Elmendorf AFB at the Cherry Hill housing area. Referred to as the Palmer Warehouse, this site was identified on a General Land Office plat map from 1914. However, the site has not been physically located on the ground, or may have been lost to continued erosion of the Knik Bluffs. This site has not been evaluated for National Register eligibility because it could not be located (USAF, 2003d)



Source: modified from USAF,1998b

0 1100 2200 4400

SCALE IN FEET

Natural Resource Areas on Elmendorf AFB

Figure 18

Fort Richardson. Only limited portions of Fort Richardson have been surveyed for archaeological resources. Five known archaeological sites exist on the 61,000 acres of Fort Richardson. The installation has a relatively low potential to contain prehistoric sites. Only one of the five identified sites has a prehistoric component. All five sites have been determined ineligible for the National Register (USARAK, 2001b). None of the sites are located on or near the proposed property to be transferred to the Air Force.

In 2002, the Army conducted a cultural resources survey for the power line road located in the same area as the proposed property to be transferred. No archaeological resources were identified during this survey.

Five areas on Fort Richardson have a relatively high potential to contain archaeological resources: the mouth of Eagle River; the shoreline of Knik Arm; upstream portions of Ship Creek; the Fossil Creek drainage; and, the Elmendorf Moraine. The proposed property to be transferred is not located in any of these areas with high archaeological sensitivity.

The proposed property to be transferred is located within Training Area 15, a relatively small and isolated training area south of the cantonment. The training intensity in Training Area 15 is considered low.

3.8.2 Historic Resources

Elmendorf AFB. Three historic districts associated with military use have been identified on Elmendorf AFB: the Flightline Historic District; the Alaska Air Depot Historic District; and the Generals' Quad Residential District. These three districts are located in the central cantonment area of the Base. Other areas on the Base containing National Register eligible historic buildings include the Ammunition Storage/Defense, Recreation/Chapel, and Cold War Era functional areas.

In 1996, the National Park Service researched and inventoried approximately 200 World War II-era facilities on Elmendorf AFB. The study found 70 World War II-era resources eligible for listing in the National Register, including the ten buildings in the Generals' Quad Historic District. The study identified six resources dating to the Cold War that are considered eligible for the National Register. None of the Cold War Era historic resources are located in or near the Government Hill or Core housing areas.

A total of 56 historic buildings or structures on Elmendorf AFB are considered eligible for the National Register. These structures include ten buildings in the Generals' Quad Residential District, as shown on Table 16. These residential buildings date to World War II are clustered together near the center of the recreational area bounded by 5th, 6th, F and H Streets. The ten buildings are considered eligible for the National Register as contributing buildings to the Generals' Quad Historic District under Criterion A (properties associated with events that have made a significant contribution to the broad patterns of U.S. history). The Alaska SHPO concurred with these findings in 1999.

In 2001, an inventory and evaluation of Cold War Era structures on Elmendorf AFB was conducted. The 2001 study made the recommendation that Bldg 8419 is not eligible, and Bldg 8433 is eligible, for listing on the National Register. This study has not been reviewed by the Alaska SHPO. Pending agreement between the Air Force and the SHPO, or a decision by the Keeper of the National Register, buildings recommended eligible in the 2001 study will be treated as eligible for the National Register. A Draft Programmatic Agreement among Elmendorf AFB, the United States Department of the Air Force, the Advisory Council on Historic Preservation, and the Alaska Office of History and Archaeology has been developed for the operation, maintenance and development undertakings at Elmendorf AFB.

Table 16. National Register Eligible Buildings Within the Generals' Quad Residential District, Elmendorf AFB

Bldg No.	Description	AHRS Number	Date of Construction
8409	Auto Garage	998	1942
8411	Auto Garage	1000	1942
8419	F/O Housing	997	1942
8423	F/O Housing	1001	1942
8433	Quarters One	43	1942
8434	Auto Garage	996	1942
8436	F/O Housing	995	1942
8439	Auto Garage	1002	1942
8445	Auto Garage	999	1942
8450	Alaska Chateau	42	1942

Source: USAF, 2003d

There are 365 buildings or structures on Elmendorf AFB that have not been evaluated for National register eligibility, but are, or will become, 50 years of age by 2007. The existing 986 MFH units on Elmendorf AFB that would be conveyed were constructed from 1942 to 1965, with some units constructed during the Cold War period (1945 to 1989). Many units have been extensively renovated over the years. There are 120 housing units constructed between 1958 and 1989 that have not been evaluated for National Register eligibility (USAF, 2003d).

Fort Richardson. Two properties on Fort Richardson are listed on the National Register of Historic Places. Nike Site Summit Historic District and the Fort Richardson National Cemetery were placed on the National Register of Historic Places in 1996 and 1984, respectively.

The Army identified 46 properties on Fort Richardson that are 50 years of age or older. These structures were constructed in the 1940s and include officers' quarters, warehouses, igloo storage and vehicle maintenance structures. The Army is in the process of inventorying and documenting these properties to determine eligibility for the National Register. In early 2003, the Army completed a study on the Cold War context for Fort Richardson to provide guidelines for evaluation of Cold War historic properties on the installation (USARAK, 2003).

Three water well and pump buildings (Bldgs 35610, 35620 and 35630) are located on the Fort Richardson property that would be transferred to the Air Force. These utility buildings were constructed from 1957 to 1958, and have not been formally inventoried or identified as eligible for the National Register (USARAK, 2003).

Several abandoned building foundations, a buried building and a concrete bunker are also present on the property to be transferred to Elmendorf AFB. These structures have not been evaluated for historic significance. The year of construction of these structures is not known, and these buildings have not been formally inventoried or identified as eligible for the National Register (USARAK, 2003).

3.8.3 Traditional Cultural Resources

Elmendorf AFB. Two federally recognized Alaska Native tribes are located in villages along Cook Inlet to the north of the Base: the Knik Tribe and the Eklutna Native Village (USAF, 2001a; USAF, 2002c). The neighboring Alaska Native Villages have raised concerns regarding cultural resources that may be located on Elmendorf AFB. At present, there are no known Alaska Native burial grounds, or sacred areas located on Elmendorf AFB that would be subject to the provisions of the American Indian Religious Freedom Act (AIRFA) or the Native American Graves Protection and Repatriation Act (NAGPRA) (USAF, 2003d).

Fort Richardson. Native Alaskans in the Fort Richardson area are descendants of the Athabaskan-speaking Denaina who occupied the Cook Inlet region at the time of European contact. Two federally recognized Denaina villages near Fort Richardson are the Knik Village and the Eklutna Native Village. In addition, three village corporations have also been established: Cook Inlet Region, Incorporated; Knikatnu Incorporated; and, Eklutna Incorporated. These Native Alaskan corporations have also participated in consultations with the Army (USARAK, 2003).

3.9 GEOLOGICAL RESOURCES

3.9.1 Physiography and Geology

Elmendorf AFB. Elmendorf AFB lies within a lowland area that is part of the Cook Inlet-Susitna Lowlands, a physiographic province within the Pacific Mountain System. The Cook Inlet-Susitna Lowlands cover an extensive area, part of which is submerged by the waters of Cook Inlet. The area is bordered on the west by the Alaska Range, on the east by the Kenai and Chugach Mountains, and on the north by the Talkeetna Mountains. The Pacific Mountain System runs in an arc from southeastern to south-central Alaska and includes the Alaska Peninsula and Aleutian Islands to the west (USAF, 2000).

The Anchorage area is bordered by two fault systems: the Bruin Bay-Castle Mountain fault system to the west, and the Border Ranges fault system running parallel to the Base of the Chugach Mountains to the east. Elmendorf AFB is in a tectonically active region that has experienced numerous earthquakes (nine seismic events exceeding 8.0 on the Richter scale within the last 85 years) and volcanic eruptions (including Mount Spurr, Mount Augustine, and Mount Redoubt) since 1954 (USAF, 2000).

Regional bedrock does not outcrop within the Base, but is exposed along the flanks of the Chugach Mountains, where the bedrock generally consists of a consolidated, complex mixture of metamorphosed sedimentary and igneous rocks deposited during the late Paleozoic and Mesozoic Eras. A unit of moderately consolidated sedimentary rocks (the Kenai Group) overlies these rocks, up to 20,000 feet thick, that filled a gradually sinking trough in the Cook Inlet-Susitna Lowlands during the Tertiary Period of the Cenozoic Era. The Kenai Group is found extensively throughout the lowlands, but is covered by unconsolidated deposits on the Base. The Mesozoic and Cenozoic deposits form the bedrock underlying the Base. By definition, bedrock must consist of consolidated deposits; at Elmendorf AFB, it is characterized by low permeability (USAF, 2000).

Fort Richardson. Geology of the Fort Richardson area was shaped by the formation of the Chugach Mountains in the late Paleozoic and Mesozoic Eras and the subsequent flow of sediments into lowlands during the Tertiary period. Bedrock of metamorphic rocks of the McHugh complex is found in the Chugach Mountains. This bedrock in lowlands rarely surfaces due to its cover of thick deposits of unconsolidated material that accumulated during the Holocene Period. Fort Richardson straddles both the alluvial fan of the Anchorage plain and the moraine and glacial alluvium complex near the shore of Knik Arm. The gravel alluvium of the Anchorage plain underlies the main cantonment (USARAK, 2001a).

The surface geology in the area of the property to be transferred to Elmendorf AFB is composed of glacioalluvial and other related alluvial and deltaic deposits. An area of estuarine and glacioestuarine deposits is also found in this location.

The Fort Richardson area is seismically active and has experienced at least nine major earthquakes in the last 85 years. The area has experienced tremors and ash fall from volcanic eruptions of Mount Spurr, Mount St. Augustine, and Mount Redoubt since 1954. Two faults border Anchorage: the Border Ranges Fault bisects Fort Richardson; and the another fault in the Chugach Mountains skirts the Ski Bowl area of Fort Richardson (USARAK, 2001a).

3.9.2 Topography

Elmendorf AFB. Regional landforms in the Cook Inlet-Susitna Lowlands are largely the result of glacial or glacier-related processes. On Elmendorf AFB, these landforms consist of a terminal moraine, an area of ground moraine, and a large outwash plain.

The Elmendorf Moraine is a system of ridges running northeast to southwest across the center of the Base. This system marks the terminus of the last glacial advance in this area. The moraine is one half to one mile in width, and reaches an elevation of 389 feet at its highest point on the Base. In most places the south-facing slopes are steep and the north slopes gentle. Much of moraine is covered by kettles (steep-sided depressions) and kames (conical hills or short irregular ridges) created by melting blocks of ice during the glacial retreat. Many of the kettles on the moraine contain ponds and lakes while others contain bog deposits, and still others remain unfilled. None of the ponds or lakes are drained by streams. Additionally, these areas may have glacially deposited Eocene fossils from the Wishbone Formation.

The Ground Moraine formed under or adjacent to glacier ice and underlies roughly the entire northern third of the Base, beginning on the north side of the Elmendorf Moraine. Along the Knik Arm, the moraine is almost continuously exposed, forming bluffs ranging in height from 20 to 100 feet. Away from the Knik Arm, the surface is pitted with kettles and many drumlins (elongated gravel hills parallel to glacial movement) that are oriented towards the southwest. The entire ground moraine is an area of relatively low relief, seldom varying more than 75 feet in elevation. Drainage of the ground moraine is not well integrated, although small streams occupy channels cut during the glacial retreat. Six-Mile Creek occupies a 125-foot deep, abandoned channel cut by Eagle River, which now is three miles farther north. Most of the channels are oriented towards the southwest and give the area a distinctive, striated appearance from the air. Most of the kettles on the ground moraine are shallow depressions forming bog lakes or unfilled depressions. Streams do not drain these kettles.

The Outwash Plain, found south of the Elmendorf Moraine, is a broad, gently sloping surface composed of sand and gravel. It covers approximately the southern third of the Base and was formed from alluvial deposits placed down in layers by Eagle River during glacial advances and by Ship Creek in modern times. Ship Creek has cut a flood plain channel varying in depth from 20 to 50 feet below the surface of the plain. The plain's low relief, combined with deep gravel, provides perfect conditions for construction of buildings and runways. The cantonment area and flightline are built almost entirely on the outwash plain (USAF, 2000).

Fort Richardson. Fort Richardson lies between the Turnagain Arm and the Knik Arm of the Cook Inlet in a roughly triangular-shaped lowland. To the east, the Chugach Mountains rise abruptly to elevations over 5,000 feet. From an elevation of 1,000 feet at the base of the mountains, the land declines into the Anchorage plain to the coast. The Anchorage Plain is a glacial moraine that extends from the mountain front westward and northwestward. Steep bluffs, broken only by principal streams such as Eagle River, characterize the edge of the plain as it drops sharply to the sea (USARAK, 2001a).

3.9.3 Soils

Elmendorf AFB. The soils of Elmendorf AFB and the surrounding area are generally dominated by three types of unconsolidated deposits based on grain size, sorting, permeability, and depositional method. Soil types include the following:

- Coarse-grained deposits consisting of sand and gravel deposited by streams (glacial outwash) in the outwash plain and along modern stream channels, lakes, or estuaries. This material is generally well-layered and well-sorted with moderate to high permeability. This type of deposit also consists of sand placed by streams, wind, or in still water ponds, lakes, and estuaries. These are generally well-stratified and sorted with moderate to high permeability. Coarse-grained deposits are also composed of sand and gravel deposited mainly by moving water within, or adjacent to, glacier ice. This material is generally moderately well-stratified and well-sorted, but less homogeneous than stream deposits,

has moderate to high permeable, and is represented by ground moraine features such as kames and eskers.

- Fine-grained deposits consisting of silt and clay deposited in still water such as former lakes and ponds in the ground moraine, former marine estuaries, and tidal zones. These deposits are often found interbedded with sand and gravel, and with till. The silts and clays are usually saturated with water, but transmit it so slowly they can be, and commonly are, impermeable in a practical sense. Fine-grained materials also include the distinctive Bootlegger Cove clay. This material may contain interbeds of fine sand and is also usually saturated with water, but is classified as impermeable because of slow transmittal time.

- Till, a mixture of coarse and fine-grained material consisting of boulders, gravel, sand, silt, and clay, is found in well-sorted interbeds or poorly-sorted single beds. It originated as the result of glacial deposition; however, it is found on Elmendorf AFB intermixed as part of a combination of glacial, marine, and lacustrine deposits. Till deposited by glaciers includes long ridges marking the margins of former glaciers; Elmendorf Moraine is an example. Till of mixed origins includes elongate hills such as drumlins. Till, although saturated with water, can be relatively impermeable because of slow transmittal time; however, water-yielding sand and gravel are commonly present in shallow till (USAF, 2000).

Soil erosion is a concern at three sites on Elmendorf AFB: Ship Creek (erosion problems associated with periodic flooding); the Cherry Hill Ditch outfall; and isolated areas on the Base due to runoff and lack of a storm water drainage system (USAF, 1998b).

Fort Richardson. Soils on Fort Richardson are shallow, immature and deficient in primary plant nutrients, especially nitrogen and phosphorous. Soils often exhibit low water retention capability. In depressions and saturated areas, such as wetlands, surface horizons may be covered with peat (partially decomposed herbaceous vegetation) (USARAK, 2001a).

Soils on the property to be transferred to Elmendorf AFB are expected to be of the Jacobsen series, a very stony silt loam that is poorly drained. Stones and cobbles make up about 40 percent of the volume, with 20 percent gravel. Permeability is moderate, and the erosion hazard is slight.

3.10 INFRASTRUCTURE AND UTILITIES

3.10.1 Water Supply

Elmendorf AFB. Elmendorf AFB purchases water from the U.S. Army Alaska at Fort Richardson. The major source of the Fort Richardson water supply is surface intake from a dam and reservoir at Ship Creek. The Municipality of Anchorage is no longer served by this water system, and only relies on the Ship Creek dam for backup supply only.

The capacity of the water treatment plant at Fort Richardson is 7 million gallons per day (mgd). The water is filtered and treated at the water treatment plant on Fort Richardson before being conveyed to the Base. Elmendorf AFB has one potable water storage facility, a 2-million gallon underground storage tank.

The water distribution system extends from Fort Richardson onto Elmendorf AFB in a system of mains and distribution lines to supply water to all users on the Base. The general age of the water line system is approximately 40 years. Water lines, valves and hydrants on Elmendorf AFB are in the process of being replaced.

The average consumption of potable water on Elmendorf AFB is approximately 3.5 mgd which is provided solely by Fort Richardson. The Base does not have separate non-potable water supply system for fire protection. The water supply system is adequate to support all existing and future requirements on the Base without limitations to future development. The potable water wells and the water treatment plant at

Fort Richardson will continue to provide a high standard of water quality to satisfy the domestic and firefighting requirements of Elmendorf AFB. Other than ongoing replacement of lines, valves and hydrants, no additional improvements to the water supply and distribution system are required (USAF, 2001a and 1998b).

Fort Richardson. Domestic water on Fort Richardson is supplied by Ship Creek. The Fort Richardson Dam on Ship Creek is a 50-ft high concrete structure located near the 500-ft contour on the Chugach Mountain slope one mile southeast of Moose Run Golf Course. The dam forms a 5 million gallon reservoir, which provides all the potable water for Fort Richardson and Elmendorf AFB and nearly half the water for the Municipality of Anchorage. Fort Richardson and Anchorage have separate water treatment plants and delivery systems. Fort Richardson has several backup water wells fed by a shallow aquifer along Ship Creek south of the central heat and power plant. Wells 1, 2 and 3 are groundwater supply wells for Fort Richardson and Elmendorf AFB. These wells are located near the proposed site to be transferred (Well 3 is located on the property). A 14-inch water line from Fort Richardson that supplies the hospital is found in the area of the property to be transferred to Elmendorf AFB. A connection to the Municipality of Anchorage water supply system is located on Provider Drive near Chugach housing and the hospital.

3.10.2 Wastewater Treatment

Elmendorf AFB. Elmendorf AFB discharges its sanitary wastewater into the Municipality of Anchorage wastewater treatment system. As of 2001, the average flow from Elmendorf AFB was 2 mgd. The treatment plant has a capacity of 58 mgd and is currently running at approximately 50 percent capacity. Remote facilities located on the north side of the runway are not connected to the Base sewer system and are on a septic tank system with leach fields. Sewer mains are located along the main roadways of each of the MFH areas (USAF, 2001a).

The Municipality of Anchorage sewage treatment plant is adequate to meet the wastewater treatment requirements of Elmendorf AFB. Although all components of the system are presently adequate to meet daily and future requirements, the General Plan for Elmendorf AFB states that:

- the Air Force should consider long term improvements associated with Base development and system growth; and,
- routine analyses should be performed to detect leaks, infiltration or system failure (USAF, 1998b).

Fort Richardson. An existing sewer line is located on the property to be transferred to Elmendorf AFB.

3.10.3 Storm Water Management

Elmendorf AFB. The storm water drainage system at Elmendorf AFB serves to provide adequate drainage to sustain normal surface runoff and prevent flooding. The storm water drainage system consists of catch basins, culverts and drywells that guide storm water through a combination of underground pipes, man-made ditches and natural drainages. The system has four outfalls with the potential of reaching U.S. waters. The majority of Base storm flow exits via two outfalls that join together before discharge into the Cook Inlet. This outfall is known as the Cherry Hill Ditch. Snow removal from roads and airfield pavements is collected and relocated to three main snow storage areas at Cherry Hill, the West Ramp and an open area east of Runway 15/33. Storm drainage lines are present along main roadways in the Government Hill and Core housing areas.

Discharge of pollutants into the storm water drainage system at Elmendorf AFB is prevented by a series of best management practices and the Storm Water Pollution Prevention (SWPP) program. The SWPP Plan identifies practices to ensure that hazardous and environmentally damaging materials are appropriately handled and stored to prevent pollutant infiltration of surface waters.

While there are deficiencies in limited areas of the Base, the condition and capacity of the storm water drainage system are adequate for collection and disposal of storm water into the existing infrastructure and natural drainages on Elmendorf AFB. Although all components of the storm water system are presently adequate to meet daily and future requirements, the General Plan for Elmendorf AFB states that:

- the Base should identify areas essential to the management of snow removal and storm water drainage systems, and preserve such areas, in planning for Base development and growth; and
- the Base should continue to promote best management practices to prevent roadway and facility deterioration that could result from improper storm water drainage.

Fort Richardson. Storm water drainage systems and management practices are in place for industrial areas within the cantonment area of Fort Richardson. No stormwater drainage features are present on the property to be transferred to Elmendorf AFB.

3.10.4 Natural Gas

Elmendorf AFB. Natural gas is provided to Elmendorf AFB through the local distribution company, Enstar Natural Gas Company. Enstar provides uninterrupted service to the Base and has indicated that there are no capacity of supply hindrances within the system. Enstar maintains excess capacity for future needs. The existing natural gas system on Elmendorf AFB is adequate to support existing and future requirements (USAF, 2001a).

Fort Richardson. Natural gas is provided to Fort Richardson by Enstar Natural Gas Company. Natural gas suppliers are committed to providing 100 percent of needs for the next five years, with high commitments into the next decade (Lee, 2003). A natural gas line is present along Provider Drive extending from the Chugach housing area.

3.10.5 Electricity

On June 3, 1999, E.O. 13123, *Greening the Government Through Efficiency in Energy Management*, was signed by the President. This law mandates the Federal Government, as the largest energy consumer, to significantly improve its energy management to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change. This law requires the Federal Government to lead the Nation in energy efficient building design, construction and operation in addition to the promotion of energy efficiency, water conservation and the use of renewable energy products as part of effective energy management.

Elmendorf AFB. The Elmendorf AFB Central Heat and Power Plant is the main source of electric power on the Base. The output of the power plant is 17,000 kilowatts (kw). Due to Base demand, the power plant is augmented by tie-ins to Anchorage Municipal Light and Power, particularly during the winter season which has exceeded the base output by 0.5 kw per day.

The Base is conducting a power study to examine the capacity of the electrical system and alternatives for supplying Elmendorf AFB with adequate power supplies in the future. The electrical system, in its present condition, is nearing capacity.

The Air Force ensures that energy conservation is managed in accordance with AFI 32-7080, *Pollution Prevention*, as described in Subchapter 3.6.3.

Fort Richardson. Electrical lines are present along Power Line Road which runs diagonally through the property to be transferred to Elmendorf AFB. A primary electrical substation is located along Provider Drive west of Chugach MFH area. Overhead electrical and underground cable lines are present to provide power to the DoD/VA Hospital west of the Fort Richardson property.

3.10.6 Solid Waste Management

Elmendorf AFB. Municipal solid waste (MSW) management at Elmendorf AFB is managed in accordance to the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. The instruction incorporates by reference the requirements of Subtitle D, 40 CFR Parts 240 through 244, 257, and 258, and other applicable federal regulations, AFIs and Department of Defense Directives (DoDD). In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program to incorporate: procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and, pollution prevention.

Refuse collection and disposal are functions of the 3rd Civil Engineer Squadron. On Elmendorf AFB, these functions are contracted to a civilian contractor. Solid waste is transported offsite to the Anchorage Regional Landfill. The anticipated lifespan of the existing cell of this landfill is approximately ten years, with planned expansion of the landfill to accommodate the needs for the next 50 to 90 years (USAF, 2001a).

The Third Wing Civil Engineers Squadron (3CES) is in the process of converting all dumpsters on Elmendorf AFB to bear-proof dumpsters in an effort to meet the goal of minimizing bear-human conflicts.

Fort Richardson. The Army manages solid waste in accordance with Subtitle D, 40 CFR Parts 240 through 244, 257, and 258, and other applicable federal regulations, and Department of Defense Directives. Fort Richardson has implemented a solid waste management program to incorporate procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention.

3.11 TRANSPORTATION SYSTEMS

Elmendorf AFB. The Base is accessed via Vandenberg Avenue and Glenn Highway (U.S. Highway 1) from the east, and 5th Avenue from the south. Vandenberg Avenue is a secondary road that becomes Talley Avenue upon entering Elmendorf AFB. The Glenn Highway is a major arterial connecting the Base to the greater Anchorage area.

Arctic Warrior Drive runs through the cantonment and provides access to Government Hill and the Core housing areas. Fighter Drive is a main street connecting both housing areas. Access to Elmendorf AFB is provided through five entrance gates: Boniface (Main) Gate, Muldoon Gate, Gate 5, Post Road Gate, and the Government Hill Gate.

Fort Richardson. Glenn Highway bisects Fort Richardson through the center of the installation. As the primary access to the installation, the Glenn Highway is the most heavily used highway in the State, connecting south-central Alaska to the Matanuska Valley.

Vandenberg Avenue runs east-west, passes through the center of the cantonment, and connects Fort Richardson to Elmendorf AFB. Arctic Valley Road connects Vandenberg Avenue to the Glenn Highway. Paved roads are not present on the proposed site to be transferred to Elmendorf AFB. An unpaved road known as Power Line Road bisects the property. Access to the proposed housing area would be via the Glenn Highway (U.S. Highway 1), Muldoon Road or Provider Drive.

3.12 PUBLIC SERVICES

3.12.1 Police

Off-Base. The Anchorage Police Department is the largest police department in Alaska serving a population of approximately 227,000 in a service area encompassing 159 square miles.

On-Base. The 3rd Mission Support Group Commander has responsibility for the control and safeguard of Base property. Routine patrolling of housing areas is accomplished on a 24-hour basis by the security police.

3.12.2 Fire Protection

Off-Base. The Anchorage Fire Department currently staffs eleven fire stations. There are Basic Life Support, Advanced Life Support engine companies, truck companies, aerials, heavy rescue company and tankers that serve as front line suppression and Emergency Medical Service (EMS) response units. The Anchorage fire service area covers the immediate 100 square miles of the Anchorage bowl; EMS coverage extends throughout the 1,980 square miles of the entire Municipality.

Mutual Aid agreements exist between the Anchorage Fire Department, State of Alaska International Airport Aircraft/Rescue/Fire, Elmendorf AFB Fire Department, Fort Richardson Fire Department, Girdwood Volunteer Fire Department and Chugiak Volunteer Fire Department. In addition, the Alaska State Division of Forestry and the U.S. Bureau of Land Management help protect residents and property lying within the 2,000 square mile Municipality during the wildland fire season.

On-Base. The Elmendorf AFB Fire Department provides service to properties within the boundaries of the Base. The Elmendorf AFB Fire Protection Flight is responsible for instructing family housing residents on the procedures to follow in case of fire.

3.12.3 Medical Services

Off-Base. Emergency medical services are available in the Anchorage area through the Anchorage Fire Department, local hospitals (i.e., Anchorage Regional Hospital) and various medical care providers in the Anchorage area.

On-Base. On Elmendorf AFB, hospital and medical clinic services are provided by the 3rd Medical Group in a joint venture with the Veterans Administration (VA). The DoD/VA Joint Venture Medical Treatment Center is located on the southeastern portion of Elmendorf AFB adjacent to the Fort Richardson boundary.

3.13 SAFETY

The primary safety considerations for the Proposed Action would be factors relevant to placement of housing on an existing military installation. Safety considerations are limited to health hazards associated with exposure to electric and magnetic fields (EMF) due to the proximity of the Fort Richardson property to antenna facilities on Elmendorf AFB and Fort Richardson. The safety associated with placement of housing near existing ordnance storage is also a consideration.

Nuisance Wildlife. The primary response to nuisance, injured or dangerous wildlife on Elmendorf AFB lands has been delegated to 3 CES/CEVP military conservation agents by the Alaska Department of Fish and Game and 3rd Wing Commander.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter provides the scientific and analytic basis for comparing the environmental consequences of the Proposed Action, the No Action Alternative, and the Alternative Action. The probable effects of each alternative on environmental resources are described for Elmendorf AFB and Fort Richardson.

This chapter focuses on impacts considered potentially significant. The general approach followed throughout this chapter is to describe briefly the range of impacts that would occur and then provide a detailed discussion of impacts that are considered significant.

The specific criteria for determining the significance of impacts and assumptions for the analyses are presented under each resource area. Significance criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. Long-term implications of the Proposed Action and alternatives are also presented in this chapter.

4.1 MISSION

4.1.1 Proposed Action

The activities associated with implementation of the Proposed Action would not impact ability of the Air Force or Army to meet the mission of Elmendorf AFB or Fort Richardson, respectively. The private sector financed housing would enable the Government to continue to support the housing needs of military personnel stationed at Elmendorf AFB. The Proposed Action would have the beneficial effect of providing housing units that meet current housing guidelines and building codes.

4.1.2 No Action Alternative

The No Action Alternative would result in no change from baseline conditions. As a result of the No Action Alternative, the Air Force may be unable to support housing needs of military personnel in future years. Military personnel would continue to reside in units that do not meet current housing guidelines and building codes.

4.1.3 Alternative Action

The Alternative Action would result in the same effects as the Proposed Action. The resultant number of housing units would be the same as the Proposed Action, with more renovated units being provided than newly-constructed units.

4.1.4 Cumulative Impacts

The Proposed Action would support the current and future mission of Elmendorf AFB, and would not contribute to any cumulative impacts. The Proposed Action would not have any cumulative effect on the current and future mission of Fort Richardson.

4.1.5 Mitigation

No mitigation measures are required.

4.2 NOISE

In considering the basis for evaluating significance of noise impacts, several items were examined, including: 1) the degree to which noise levels generated by construction, addition, and alteration activities were higher than the ambient noise levels; 2) the degree to which there is annoyance and/or activity interference; and 3) the proximity of noise-sensitive receptors to the noise source.

An environmental analysis related to noise includes the potential impacts on the local population. This analysis estimates the extent and magnitude of the noise generated by the Proposed Action.

As described in Subchapter 3.2.1, the metric most widely used for noise-compatible planning is DNL. Air Force planning policy includes interpretation of DNL in terms of compatible land use. This is based on relationships between DNL and the probability of highly annoying the population. The metrics used to describe noise impacts in this study are DNL.

4.2.1 Proposed Action

Elmendorf AFB. The Proposed Action would result in short-term noise impacts associated with the demolition and construction of housing on Elmendorf AFB. No changes in land use, traffic volumes or general traffic patterns, or other noise generating activities would occur because housing would be renovated or constructed within the footprint of existing housing areas.

Assuming that noise from demolition and construction equipment radiates equally in all directions, the sound intensity would diminish inversely as the square of the distance from the source. Table 17 shows the anticipated sound pressure levels at a distance of 50 feet for various heavy equipment that would typically be used during the construction process.

Table 17. Heavy Equipment Noise Levels at 50 Feet

Equipment Type	Number Used[a]	Generated Noise Levels (dB)[b]
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Asphalt Spreader	1	80
Roller	1	80
Flat Bed Truck (18 wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

a Estimated number in use at any time.
b Source: CERL, 1978.

The primary source of noise from during demolition and construction would be generated by equipment and vehicles involved in demolition, site preparation, foundation preparation, construction, and finishing work. Demolition and construction noise would be intermittent and short-term in duration. Typical noise levels generated by these activities range from 75 to 89 dB at 50 feet from the source. Sensitive receptors in the vicinity of these short-term activities would include occupied housing units not yet demolished located near the work site.

For the purposes of this assessment, it is estimated the shortest distance between a demolition or construction noise source and a residence would be approximately 100 feet. Therefore, outdoor noise at an occupied residence could be as high as 63 to 77 dB. Outdoor noise at adjacent housing units could be as high as approximately 57 to 71 dB (Figure 7 contains typical sound levels from outdoor noise sources). It is anticipated the demolition and construction activities would occur between 7:30 a.m. and 4:00 p.m., five days per week for the duration of the project. Therefore, nearby residents should not experience loss of hearing although some temporary annoyance associated with noise may occur. Sleep interference is unlikely because the demolition and construction activities would occur during the daytime (it is possible that some sleep disturbance may occur for shift workers).

Short-term increases in noise levels would occur during demolition and construction activities as described above. The primary source of noise at Elmendorf AFB would continue to be from aircraft operations and the noise contours would remain as depicted in Figure 8. It should be noted that noise from flying activities would tend to mask the noise generated by construction projects for the same exposure area. The perception would be that construction noise likely would not be discernible during periods of aircraft operations. However, there could be periods of time during which construction noise could be discerned and provide minor annoyance. Due to the intermittent nature of construction noise, the overall DNL noise level would not be expected to change from existing conditions.

It is expected that the layout of the replacement housing units in the Government Hill and Core housing areas would be arranged in approximately the same pattern as the baseline condition. Most of the additional units to be constructed adjacent to Cherry Hill and Boulder MFH areas would be located within the DNL 65 to 70 dBA noise zone, with some units in the DNL 70 to 75 dBA noise zone. Noise from vehicular traffic in the residential areas would be similar to existing conditions because no net change in the number of MFH units would result on Elmendorf AFB. Housing occupants would continue to access the housing areas using existing roadways. While no net change to exterior noise levels would be expected, a noise level reduction of approximately 18 to 27 dB would be achieved by the incorporating newer housing unit construction materials with improved sound insulation properties (USDOT, 1992).

Noise impacts from demolition and construction of housing at Elmendorf AFB would be limited to short-term, localized increases in noise levels directly associated with the use of demolition and construction equipment. After units are constructed, the noise environment would be similar to baseline conditions. These effects would not be considered significant impacts to the noise environment.

To prevent or minimize adverse effects on the noise environment, the Air Force would ensure that the following best management practices are incorporated into the project:

- Design and construction of the renovated and new housing units to comply with the Air Force NLR policy to attain interior noise levels of DNL 45 dBA or less.

- Development of a housing vacancy plan that would keep occupied units as far away as possible from planned construction activity.

Fort Richardson. The proposed construction of housing on property to be acquired from Fort Richardson would result in short-term noise impacts associated with the use of equipment for the clearing, site preparation and construction of units over a period of approximately four years. Typical noise levels generated by these activities range from 75 to 89 dB at 50 feet from the source. The nearest sensitive receptors at the Hospital and Bartlett High School may experience a temporary increase in noise levels during construction work on the site. The nearest residents in the project area, occupants at Chugach MFH area approximately 0.5 mile southwest of the property, would not be expected to experience any temporary increase in noise from construction.

For the purposes of this assessment, it is estimated the shortest distance between a demolition or construction noise source and a residence would be approximately 100 feet. Therefore, outdoor noise at the school could periodically be as high as 63 to 77 dB. Outdoor noise at adjacent housing units could be as high as approximately 57 to 71 dB. It is anticipated the demolition and construction activities would

occur between 7:30 a.m. and 4:00 p.m., five days per week over the four year duration of the project. Based on the limited and intermittent noise exposure, nearby residents should not experience loss of hearing. Sleep interference is unlikely because the demolition and construction activities would occur during the daytime (it is possible that some sleep disturbance may occur for shift workers). Temporary periods of increased noise would not result in overall noise levels that exceed the Air Force criteria of DNL 75 dBA.

The Proposed Action to place new housing units on Fort Richardson property would result in an increase in vehicular-related noise from occupants accessing the new housing area. Access to the proposed housing area would be via the Glenn Highway (U.S. Highway 1), Muldoon Road or Provider Drive. Noise levels along these roadways may experience localized increases in traffic volumes as a result of the Proposed Action. With proper roadway design, the resultant noise level associated with the housing area(s) at this location would not be expected to exceed the Air Force criteria of DNL 75 dBA.

To prevent or minimize adverse effects on the noise environment, the Air Force would ensure that the following best management practices are incorporated into the project:

- Construction methods to include noise reduction measures to minimize noise impacts on the Hospital and Bartlett High School.
- Design of access roadways to the new housing area(s) on Fort Richardson to minimize traffic-related noise impacts to the hospital and Bartlett High School.
- Design and construction of the new housing units to comply with the Air Force NLR policy to attain interior noise levels of DNL 45 dBA or less.
- Design of housing units to include a buffer area that would minimize noise impacts on the hospital and Bartlett High School.

With incorporation of best management practices into the project, impacts to the noise environment would not be considered significant.

4.2.2 No Action Alternative

The noise environment at Elmendorf AFB and Fort Richardson would not change from baseline conditions as a result of implementation of the No Action Alternative.

4.2.3 Alternative Action

The Alternative Action would result in more renovation activities on Elmendorf AFB. Noise impacts during these activities would similar to that described for the Proposed Action. After units are renovated or constructed, the noise environment would be similar to baseline conditions. Alternative Action noise impacts would be limited to short-term increases in localized noise as described for the Proposed Action (Subchapter 4.2.1). These effects would not be considered significant impacts to the noise environment.

4.2.4 Cumulative Impacts

Noise impacts from the Proposed Action would be limited to short-term increases in localized noise on Elmendorf AFB. After units are constructed, the noise environment would be similar to baseline conditions. The Proposed Action would not contribute to any long-term cumulative impacts to the noise environment at Elmendorf AFB.

The placement of new housing on property to be acquired from Fort Richardson would result in a localized increase in ambient noise levels in the vicinity of the Hospital and Bartlett High School. This increase is considered to be a cumulative noise impact. This increase in ambient noise level would be

compatible with the planned land use for the site, and would not be expected to result in annoyance or effects on sensitive receptors. The resultant ambient noise level from the proposed housing community at this location would not be expected to exceed Air Force noise criteria and, therefore, would not be considered a significant cumulative impact to the noise environment.

4.2.5 Mitigation

Mitigation measures would not be required for the Proposed or Alternative Action.

4.3 LAND USE

In considering the basis for evaluating significance of impacts on land use, several items were examined, including: (1) the degree to which the location of facilities would adversely affect existing sensitive land use; (2) the degree to which construction and/or operation of facilities would interfere with the activities or functions of adjacent existing or proposed land uses; and, (3) the degree to which any physical changes in land use would affect surrounding uses and compatibility with land use plans.

4.3.1 Proposed Action

Elmendorf AFB. The Proposed Action would not result in any change to current land use within the existing MFH areas on Elmendorf AFB, with the exception of the three undeveloped sites that would be used for construction of additional housing:

Use of Land Adjacent to Cherry Hill MFH. The adjacent 19.95 acres west and east of the Cherry Hill MFH would be leased to a contractor, however construction of additional housing would not occur because this area is sloped and not suitable for construction. The Proposed Action would potentially result in the loss of approximately 12.7 acres of open space south of Cherry Hill MFH. This loss of open space would occur entirely within the developed Main Cantonment Area and in an area adjacent to the existing Cherry Hill MFH area. Additional housing at this location would not be located within APZ I of the west runway. The proposed use of undeveloped land south of Cherry Hill MFH would not be in conformance with the future land use designation for this site included in the current General Plan. The General Plan, however, provides for an overall goal of achieving effective land management that includes the initiative of improving functional efficiency by locating interrelated activities in proximity to one another. The Proposed Action would result in the placement of additional housing adjacent to existing housing areas, and both sites would be located entirely within the developed Main Cantonment Area.

Use of Land Adjacent to Boulder MFH. The Proposed Action would result in the loss of approximately 11.02 acres of undeveloped land that would potentially be used for housing construction. The site, located at Arctic Warrior Drive and Fairchild Avenue, would be adjacent to the existing New Sunflower MFH area. Most of this site is classified as outdoor recreation in the existing land use map of the Base General Plan. This particular site is not designated as a Class A, B or C outdoor recreation area (Base recreational facilities) managed by the Air Force. This area is classified as housing in the future land use map for this plan. Although the Proposed Action would result in loss of 11.02 acres of outdoor recreation/open space at this location, construction of housing or related community facilities at this location would be consistent with the future land use designation for the site.

Use of Land Adjacent to the FO/CO Area. The construction of housing on land adjacent to the FO/CO Area would result in loss of 5.27 acres of land with a future designation of open space. This loss of open space would occur entirely within the developed Main Cantonment Area and in an area adjacent to the existing FO/CO housing area. The proposed use of undeveloped land would not be in conformance with the future land use designations for this site included in the current General Plan. The General Plan, however, provides for an overall goal of achieving effective land management that includes the initiative of improving functional efficiency by locating interrelated activities in proximity to one another. The Proposed Action would result in the placement of additional housing adjacent to existing housing areas.

Air Force policy discourages placing family housing in the DNL 65 to 70 dBA noise zone and strongly discourages units in the DNL 70 to 75 dBA zone. However, Air Force policy recognizes that local conditions may require family housing units in the DNL 65 to 70 dBA and DNL 70 to 75 dBA noise zones. Family housing units are incompatible in noise zones in which the noise exceeds a DNL of 75 dBA even if special building noise insulation is provided. Noise level reduction criteria would not eliminate outdoor environment noise problems and, as a result, site planning and design should include measures to minimize this impact particularly where the noise is from ground level sources (USAF, 1978).

As shown in Figures 8 and 10, the DNL 65 dBA and greater noise zones encompasses most of the Main Cantonment Area on Elmendorf AFB. Although the total livable space for the existing 986 units to be conveyed would not change, the construction of additional units on undeveloped land increases livable space by approximately 30 acres. The undeveloped land adjacent to Cherry Hill and Boulder MFH would be within the DNL 65 to 70 dBA noise zone, while undeveloped land adjacent to the FO/CO area would be within the DNL 70 to 75 dBA noise zone. Housing units in the northern portion of Seattle MFH in the DNL 75 to 80 dBA noise zone would be demolished, and this area returned to the Government for use as open space. The Proposed Action would not result in placement of any housing in areas that exceed DNL 75 dBA. For this reason, the Proposed Action would not result in incompatible land use conditions.

The Proposed Action would not result in any adverse effects on existing sensitive land use nor would it interfere with the activities or functions of adjacent existing or proposed land uses. Although the Cherry Hill MFH area would represent continuation of an incompatible land use, new housing would not be located within the clear zone or accident potential zones of the runway. Because the proposed housing would not affect surrounding land use, impacts to land use would not be considered significant.

Fort Richardson. The Proposed Action would result in the transfer of up to 352 acres of land from Fort Richardson to Elmendorf AFB. This land would be managed in accordance with Air Force land use planning objectives and policies. The Proposed Action would result in the conversion of 352 acres of open space on Fort Richardson (Army training area) into housing. While the entire 352 acres would be leased to a contractor, housing structures and community facilities would be located on approximately 241 acres. The resultant land use would be consistent with the future land use designation for this area of Fort Richardson, as shown on Figure 13. Placement of military family housing would not result in impacts to use of the adjacent Army land on Fort Richardson.

The placement of housing on the southern portion of the 352 acres on Fort Richardson would result in discontinuation of the site for recreational purposes as currently allowed under its Limited Recreation designation. Access to this area would be restricted by either the placement of security fencing along the property line for the housing area. The Air Force has reviewed the proposed housing project with the Anchorage School District and determined that the trails south of the property line would remain intact. The existing portion of the trails on Air Force property would no longer be part of the looped trail. The Air Force would clear a wide path for fence installation, thereby enabling reconnection of the trails along the fence-line to a width that can accommodate typical recreational equipment, presuming the property owner (Bartlett High School or the Alaska Native Heritage Center) would approve these changes. The resultant trails may be shorter because there is less available land upon which this activity can continue. Remaining trails would not be affected.

Impacts to forest resources would not be expected as a result of the Proposed Action. This land to be transferred to Elmendorf AFB is not subject to forest management practices.

4.3.2 No Action Alternative

Land use at Elmendorf AFB would not change from the baseline condition as a result of the No Action Alternative.

4.3.3 Alternative Action

The Alternative Action would result in the same impacts to land use as described for the Proposed Action.

4.3.4 Cumulative Impacts

Construction projects planned for Elmendorf AFB and Fort Richardson would be consistent with planned land use patterns. In consideration of the use of open space for construction of the DOD/VA Hospital west of the proposed site on Fort Richardson, the Proposed Action would contribute to an ongoing cumulative loss of open space on Elmendorf AFB and Fort Richardson. The Proposed Action would be consistent with planned land use for these sites, and incompatible land uses would not result. For this reason, cumulative impacts to land use would not be considered significant.

4.3.5 Mitigation

No mitigation measures are required.

4.4 AIR QUALITY

Impacts to air quality would be considered significant if federal actions resulted in violation of a NAAQS, contributed to an existing or projected air quality violation, exposed sensitive receptors to substantial pollutant concentrations, or exceeded any significance criteria for maintenance of air quality.

4.4.1 Proposed Action

Fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated during the demolition of existing military family housing and the construction of replacement housing. Fugitive dust would be generated from activities associated with site clearing, grading, cut and fill operations, and from vehicular traffic moving over the disturbed site. These emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. For evaluation purposes, demolition and/or construction activities would occur over a four-year period. As a standard construction practice, construction sites will be watered as necessary to minimize fugitive dust emissions. Air pollutant emissions would be localized in the immediate work area, and would not result in any adverse effects on overall ambient air quality.

Demolition would include removal of asbestos and LBP that would be conducted in accordance with applicable environmental requirements for the safe removal and disposal of asbestos and LBP. With implementation of these procedures, adverse impacts associated with asbestos emissions and LBP dust would not be expected.

Emissions from demolition, renovation and construction activities associated with the Proposed Action are shown in Table 18. The PM_{10} values reflect a 50 percent reduction in emissions due to watering of the site.

Table 18. Estimated Construction-Related Air Pollutant Emissions from the Proposed Action

Activity	CO (tons/yr)	VOC (tons/yr)	NO_X (tons/yr)	SO_X (tons/yr)	PM_{10} (tons/yr)
Elmendorf AFB	8.04	1.67	19.89	2.15	86.82
Fort Richardson	2.44	0.14	0.55	0.06	175.74
Total Emissions	10.48	1.81	20.44	2.21	262.56
AQCR No. 8 Emissions	332,021	56,708	28,203	1,780	67,013
Percentage of Emissions	0.0032%	0.0032%	0.0725%	0.1244%	0.3918%

Because of their short duration, construction-related emissions would not contribute to long-term air pollution problems. Emissions during demolition of existing housing and construction of replacement housing would be less than allowable significance thresholds, and therefore, would not be considered adverse.

Analysis of the data presented in Table 18 indicates that the overall ambient air quality within the Cook Inlet Intrastate AQCR No. 8 would be only slightly affected by the implementation of the Proposed Action at Elmendorf AFB and Fort Richardson. Increased emissions primarily from short-term construction activities would produce slightly elevated air pollutant concentrations. The effects would be temporary, fall off rapidly with distance from the installation, and would not result in any long-term impacts to air quality.

Based on the requirements outlined in the USEPA general conformity rule published in 58 Federal Register 63214 (November 30, 1993) and codified at 40 CFR Part 93, Subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the threshold emission limits that trigger the need to conduct a formal conformity determination. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken. This rule establishes an analysis process for determining whether a proposed project in a nonattainment area conforms to the state requirements and federal standards. Emissions from the Proposed Action would fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment. However, the AQCR No. 8 is in attainment. For these reasons, a conformity determination would not be required.

The USEPA de minimis threshold level for nonattainment (or maintenance) areas is 100 tons per year for each of the five criteria pollutants. The only criteria pollutant in nonattainment in the surrounding area is CO. The Proposed Action would not result in CO emissions that exceed this threshold amount for this criteria pollutant.

Because Elmendorf AFB is located adjacent to metropolitan Anchorage which is classified as serious nonattainment for CO, emissions of this pollutant from the Proposed Action were evaluated. The maximum annual estimated CO emissions that would result from construction of the Proposed Action would represent a minimal percentage of annual CO emissions within AQCR No. 8. The CO emissions from the Proposed Action that would be generated in the Anchorage air shed would not be considered regionally significant.

Visibility impairment from emissions from the Proposed Action would not be of concern since there are no Class I PSD areas within a 62-mile radius of Elmendorf AFB.

The Proposed Action would result in housing units that utilize gas-fired boilers or gas furnaces after the heat plant shuts down in 2005. Units that are currently connected to the steam plant would be converted to individual boilers. Emissions that would result from occupancy of the additional 208 MFH units on Elmendorf AFB would represent an increase in baseline air pollutant emissions from heating sources and vehicular emissions. All of these new sources of air pollutant emissions will be incorporated into the planning inventory of Base emissions in accordance with air quality permitting requirements. Because no new personnel authorizations are anticipated for Elmendorf AFB, emissions associated with occupancy of the proposed MFH units would not result in a substantial change to baseline emissions of air pollutants in AQCR No. 8. Therefore, the air quality impacts from the Proposed Action would not be considered significant.

4.4.2 No Action Alternative

There would be no change from the baseline air quality conditions as a result of the No Action Alternative.

4.4.3 Alternative Action

The Alternative Action would result in air pollutant emissions associated with the renovation, demolition and construction of military family housing units. The estimated air pollutant emissions associated with the Alternative Action are shown on Table 19. The PM_{10} values reflect a 50 percent reduction in emissions due to watering of the site.

Table 19. Estimated Construction-Related Air Pollutant Emissions from the Alternative Action

Activity	CO (tons/yr)	VOC (tons/yr)	NO_X (tons/yr)	SO_X (tons/yr)	PM_{10} (tons/yr)
Elmendorf AFB	3.56	0.74	8.84	0.95	123.12
Fort Richardson	2.39	0.13	0.42	0.05	68.24
Total Emissions	5.95	0.87	9.26	1.00	191.36
AQCR No. 8 Emissions	332,021	56,708	28,203	1,780	67,013
Percentage of Emissions	0.0018%	0.0015%	0.0328%	0.0565%	0.2856%

Emissions for the Alternative Action would be almost equivalent to the Proposed Action; however, the Alternative Action emissions are less than the Proposed Action emissions. Analysis of the data presented in Table 19 indicates that the overall ambient air quality within the Cook Inlet Intrastate AQCR No. 8 would be only slightly affected by the implementation of the Alternative Action at Elmendorf AFB. Increased emissions primarily from short-term construction activities would produce slightly elevated air pollutant concentrations. The effects would be temporary, fall off rapidly with distance from the installation, and would not result in any long-term impacts to air quality.

As described for the Proposed Action, a USEPA conformity determination would not be required. The Alternative Action would not result in emissions that exceed USEPA de minimis threshold level for nonattainment (or maintenance) areas for any of the criteria pollutants. Therefore, the air pollutant emission impacts from the Alternative Action would not be considered significant.

The maximum annual estimated CO emissions from the Alternative Action would represent less than 0.002 percent of CO annual emissions AQCR No. 8, respectively. The CO emissions from the Alternative Action that would be generated in the Anchorage air shed would not be considered regionally significant. Therefore, the air quality impacts from the Alternative Action would not be considered significant.

4.4.4 Cumulative Impacts

Air pollutant emissions from the construction activities associated with the Proposed Action may occur during the same time period as other ongoing and planned construction projects on Elmendorf AFB and Fort Richardson. Short-term emissions from demolition and construction emissions that would be generated in the project area would not be expected to substantially contribute to cumulative impacts to air quality. Occupancy of the replacement housing would not contribute to cumulative impacts to air quality as these emissions are part of the Base emissions inventory. The air pollutant emissions associated with these activities would not be considered significant in comparison to the Proposed Action.

4.4.5 Mitigation

Potential criteria pollutant emissions associated with the Proposed or Alternative Action do not exceed significance criteria requirements. Therefore, no mitigation measures for air quality would be required.

4.5 WATER RESOURCES

Impacts to water resources would be considered significant if any of the following were to occur: substantial flooding or erosion; adverse effects on any significant water body (such as stream, lake, or

bay); exposure of people to reasonably foreseeable hydrologic hazards such as flooding or tsunamis; or, adverse effects to surface or groundwater quality or quantity.

4.5.1 Proposed Action

Elmendorf AFB. Runoff from construction areas could contain contaminants that could degrade the quality of receiving waters. The potential for increased erosion and sedimentation could occur as a result of construction that requires grading, demolition, and construction of new housing units. These activities would result in soil disturbance and increased erosion and sedimentation that could potentially enter surface waters if not properly managed.

The Air Force would ensure that construction activities are conducted in accordance with the applicable storm water discharge permit for any areas that result in soil disturbance. Site-specific management plans and Best Management Practices (BMP) would be implemented to control erosion and prevent sediment, debris or other pollutants from entering storm water during site activities. Sties shall be inspected once every seven days and changes to BMPs documented. Storm water pollution prevention shall be part of the completed project infrastructure.

The Elmendorf AFB SWPPP identifies erosion control practices to be followed for exposed soil surfaces. These standard erosion control practices include:

- Minimizing soil disturbance whenever possible;
- Use of mulch or artificial cover where repeated disturbance is expected;
- Stabilization of soil within 30 days of final disturbance through vegetative or permanent artificial means (e.g., paving or rip-rapping); and,
- Adherence to appropriate State and federal permits and procedures for significant excavation (more than one acre of disturbed soil).

With adherence to best management practices, adverse effects from erosion would be avoided. Significant impacts to surface water would not be expected as a result of the Proposed Action.

The proposed replacement housing would not result in any substantial change in the amount of impervious areas that could reduce percolation. Storm water runoff would flow into drainage systems that are of sufficient capacity. Adequate drainage would be incorporated into design of the replacement housing.

Specific BMPs to prevent discharge of contaminants into surface waters during housing demolition and construction would be followed during demolition and construction activities. In the SWPPP, the specific BMPs that would pertain to the Proposed Action include:

- Covering of outside storage of any materials or wastes;
- Adherence to state and federal guidelines for erosion and sedimentation control in any area of disturbed soil;
- Keep exterior yards, parking areas, roadways and storage areas orderly and free of materials that could add pollutants to storm water;
- Sweep paved areas as warranted; and
- Keep drainage and outfall pipes unclogged.

The SWPPP also specifies procedures for spill prevention and response, routine inspection of discharges at sites, and proper training of employees. With implementation of BMPs, impacts to surface water quality at Elmendorf AFB would not be considered significant.

The Air Force would ensure that the following best management practices to prevent or minimize impacts would be incorporated into project design and implementation:

- Design and construction of the replacement housing units to incorporate adequate storm drainage.
- Compliance with provisions of the MSGP, SWPPP and BMPs to prevent or minimize the potential for impacts to water resources.
- Include erosion control measures for all ground-disturbing construction activities. Comply with standard erosion control practices for ground disturbing activities.
- The contractor shall cease excavation if groundwater is encountered, and immediately notify 3 CES/CEVP or 3 CES/CEVR.
- The contractor shall ensure that a SWPPP and a Construction General Permit Notice of Intent with a site-specific BMP map are prepared and implemented for construction activities (site-specific SWPPPs are subject to inspection at any time by the USEPA).
- Conduct earthwork to minimize the duration of exposure of unprotected soils.
- Establish single point construction entries to minimize erosion during demolition and construction.
- Reestablish grass and other landscaping in disturbed areas immediately after construction is completed.

The excavation required for housing and associated utility lines (sewer and water) would not be expected to exceed 20 feet in depth, nor would it be expected to encounter groundwater. However, because the shallow aquifer is contaminated, efforts will be made to avoid contamination of the deeper confined aquifer. With implementation of BMPs, impacts to groundwater quality at Elmendorf AFB would not be considered significant.

The project site is not located in an area that would be impacted by a 100-year flood. The site is not in an area designated as being at risk from tsunami inundation. Therefore, significant impacts due to flood hazards would not be expected to occur in the project area.

Fort Richardson. Runoff from construction areas could contain contaminants that could degrade the quality of receiving waters. The potential for increased erosion and sedimentation could occur as a result of construction that requires grading, demolition, and construction of new housing units. These activities would result in soil disturbance and increased erosion and sedimentation that could potentially enter surface waters if not properly managed.

Construction of housing and associated community facilities on the Fort Richardson property would be accomplished with standard erosion control practices applicable to, and as described herein for, Elmendorf AFB. Construction of housing would avoid standby water wells on or near the property to be transferred. The Army would be responsible for physical security of a defined protective zone around existing standby water wells to ensure that groundwater quality is protected. The new sewer line to be constructed for housing would be sited outside the protective around the wells. The Air Force would ensure that wells and associated protection areas are protected in accordance with applicable regulations. The Air Force and the Army will work together to determine appropriate requirements and management for wellhead protection areas on the property to be transferred. For these reasons, impacts to groundwater on Fort Richardson would not be expected to occur.

Construction of the proposed new roadway from Elmendorf AFB to Arctic Valley Road (on Fort Richardson) would be conducted in accordance with standard management practices that incorporate measures to avoid detrimental effects to Ship Creek. Construction work in and near Ship Creek would be conducted in accordance with permit stipulations as determined in the Army Corp of Engineers Section 404 permit.

4.5.2 No Action Alternative

The No Action Alternative would not result in any demolition or construction activities at Elmendorf AFB or Fort Richardson. No change to surface or groundwater resources would occur.

4.5.3 Alternative Action

The impacts of the Alternative Action would be the same as described for the Proposed Action.

4.5.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects involving construction on Elmendorf AFB and the surrounding area, as identified in Table 6. Construction activity on Elmendorf AFB would occur in areas that are not in proximity to water resources. Other planned projects on Fort Richardson would not occur near Ship Creek. With adherence to best management practices for storm water management and groundwater protection, the Proposed Action would not be expected to cumulatively contribute to impacts on water resources.

4.5.5 Mitigation

With adherence to Section 404 permit stipulations (including any mitigation measures identified therein), the Proposed Action would not be expected to result in any significant impacts to surface or groundwater resources at Elmendorf AFB. Mitigation measures would not be required for the Proposed Action.

4.6 HAZARDOUS MATERIALS AND WASTES

Impacts to hazardous materials and waste management would be considered significant if the federal action resulted in noncompliance with applicable federal and Alaska regulations or caused waste generation that could not be accommodated by current or planned Elmendorf AFB waste management capacities.

4.6.1 Proposed Action

Hazardous Materials. Products containing hazardous materials would be procured and used during construction of housing units. Hazardous materials used by the demolition and construction contractor would be managed in accordance with regulatory requirements. Contractors would be required to use and store hazardous materials in accordance with all federal, state, local and Air Force regulations. Specifically, the contractor is prohibited from using ODS, mercury, polychlorinated biphenyls, asbestos-containing material (ACM), or materials that contain potentially hazardous concentrations of lead such as LBP. Hazardous materials will not be stored in containers in direct contact with the ground. Containers will be kept closed when not in use.

The Air Force would ensure that the following best management practices for hazardous materials or wastes are implemented as a requirement of the construction contractor:

- Work shall be managed in accordance with the *Elmendorf AFB Oil Discharge Prevention and Contingency Plan* (CPlan). The contractor shall be required to immediately call 552-SPIL if a hazardous substance or petroleum product is released or, if excavation activities encounter contaminated soil, tanks, or debris.

- In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the contractor will take immediate action to contain and clean up the spill.
- Contractor spill clean up personnel will be trained and certified to perform spill clean up.
- The contractor will be responsible for the proper characterization and disposal of any waste and clean up materials generated.
- All waste and associated clean up material will be removed from the Base and transported and/or stored in accordance with regulations until final disposal.
- All details concerning the spill will be provided to the Air Force in the form of a written incident report.
- The contractor is responsible for restoring a spill site to the condition prior to the spill or to an improved condition.
- Fueling and lubrication of equipment will be conducted in a manner that affords maximum protection against spills.
- Secondary containment is required around temporary fuel oil or petroleum storage tanks larger than 660 gallons and is recommended for smaller tanks.

With compliance with hazardous materials management procedures, significant impacts from hazardous materials would not be anticipated.

Hazardous Wastes. Hazardous waste generated by residents in the housing areas would continue to be considered as residential waste and would not impact hazardous waste management at Elmendorf AFB. Demolition of the existing housing would result in the generation of hazardous waste, particularly building materials with asbestos and LBP. These demolition wastes will be managed in accordance with the Elmendorf AFB Solid Waste Management Plan and OPlan 19-3.

The construction contractor shall maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date and time of collection, and other pertinent data as required by 40 CFR Part 280, Section 74 and 40 CFR, Part 262, Subpart D. Any hazardous waste generated shall be handled in accordance with all federal, state, and local laws and regulations, including RCRA requirements for waste management and Department of Transportation requirements for waste transport. Contractor-generated hazardous waste will be disposed of as required.

Pollution Prevention. Annual purchases of products containing EPA 17 and ODS chemicals, off-base transfers of hazardous waste, disposal of municipal solid waste, and consumption of energy would increase slightly during the proposed demolition and construction activities. Specifically, products containing EPA 17 and Environmental Planning and Community Right-to-Know Act (EPCRA) chemicals would be procured for use in construction of housing units. However, it is not anticipated that the volume of chemicals procured would impact the ability of the Base to meet its reduction goals.

It is anticipated that ODS refrigerants contained in existing heating, ventilation, and air conditioning (HVAC) systems would be recovered before demolition. These ODS would be reused on-base in other compatible HVAC systems, if feasible. The refrigerators would be removed from the affected military family housing units by the Air Force before the units are demolished. The preferred method for disposal of the refrigerators is to reuse or sell. However, if this method is not used, the ODS is removed and reused in compatible systems or disposed of in accordance with the applicable regulations.

The generation of hazardous waste would increase slightly during the demolition and construction. However, these increases would be temporary and would not impact the ability of the Base to attain the hazardous waste reduction goals.

Asbestos. The demolition contractor is responsible for all asbestos removal before actual demolition of the building. All friable asbestos will be removed by a licensed asbestos abatement contractor using approved abatement methods. Non-friable asbestos can be disposed of as solid waste along with other construction debris as long as the landfill is permitted to accept non-friable asbestos waste. Non-friable asbestos will be moistened just prior to removal to minimize airborne fibers. All debris mixed with ACM debris must be kept wet and must be sent to an asbestos-approved landfill. Additionally, the specifications for the proposed housing units and Air Force regulations prohibit the use of ACM for new construction.

Lead-Based Paint. The Air Force would ensure that the presence of any lead-based paint is identified before initiating demolition. Removal of lead-based paint shall comply with 29 CFR 1910. A removal plan must be approved by the government before any lead-based paint abatement. Additionally, the specifications for the proposed housing units and Air Force regulations prohibit the use of lead-based paints for new construction.

Environmental Restoration Program. The only contaminated site near the MFH areas that is undergoing remediation or investigation is ST37. The Proposed Action would not be expected to result in interference with ongoing remediation activities at Elmendorf AFB. It is unlikely that any activities associated with the demolition and construction activities would impact the sites because the site is not located within the construction zone and only shallow excavations for new housing foundations would be conducted.

The following best management practices would be implemented:

- The Air Force will ensure that coordination with the ERP Office is conducted before any demolition or construction work is initiated. The Air Force will ensure that demolition and construction activities at each MFH area are coordinated with ongoing remediation or investigation activities at any CERCLA or SERA sites.

- The Air Force will ensure that any applicable land use controls are followed as described in Subchapter 3.6.6.

- In the event that excavation encounters groundwater, sampling for contaminants is required to be conducted. Contractor supervision by 3 CES/CEVR will be provided for all excavation work above known contaminant plumes.

- The Air Force will ensure that a proper Base Civil Engineer (BCE) Work Clearance Request is processed and routed through 3 CES/CEV for each construction area in accordance with 3rd Wing Instruction 32-1007 (12 July 2001).

Coordination with the Base ERP Office would avoid conflicts with ongoing remediation and investigation activities on Elmendorf AFB. Therefore, impacts to site ST37, or to ERP management and site activities, would not be anticipated.

Pesticides. The use of herbicides and pesticides will continue to be applied to the associated landscaped areas to prevent the growth of weeds and the proliferation of insects following completion of construction of housing units. Herbicide and pesticide contamination of the housing sites are not suspected as these sites were not used for agricultural purposes.

Radon. Radon levels above the RAL would not be expected in the MFH areas on Elmendorf AFB. Since only new housing is proposed at Fort Richardson, considerations for indoor radon would be limited to following applicable design criteria for reduction of radon in new construction. The Proposed Action would not be expected to result in any impacts from radon.

Polychlorinated Biphenyls. The demolition contractor would be responsible for removal of any PCB in transformers or fluorescent light fixtures prior to demolition of housing. All PCB removal would be conducted in accordance with approved methods. The Proposed Action would not be expected to result in any impacts from PCB.

4.6.2 No Action Alternative

Hazardous Materials. There would be no change from the baseline condition to hazardous material usage or as a consequence of the No Action Alternative.

Hazardous Wastes. There would be no change from the baseline condition to hazardous waste management as a consequence of the No Action Alternative.

Pollution Prevention. There would be no change from the baseline condition to achieving pollution prevention goals as a consequence of the No Action Alternative.

Asbestos. No housing demolition would occur. Asbestos containing material on existing structures would continue to be managed in accordance with the Elmendorf AFB Asbestos Management Plan.

Lead-Based Paint. No housing demolition would occur. Lead-based paint on existing structures would continue to be managed in accordance with the Elmendorf AFB Lead-Based Paint Management Plan.

Environmental Restoration Program. No housing units would be demolished or constructed. Therefore, no ERP sites would be affected.

Pesticides. No housing units would be demolished or constructed. Therefore, herbicide and pesticide use would continue on the existing landscaped areas.

Radon. No housing units would be demolished or constructed. Radon levels above the RAL would not be expected in the existing housing areas. Therefore, impacts from radon would not be anticipated.

Polychlorinated Biphenyls. No housing units would be demolished or constructed. Any PCB in the housing areas would be left in place or managed in accordance with the Elmendorf AFB Hazardous Waste Management Plan.

4.6.3 Alternative Action

Hazardous Materials. The Alternative Action would result in the same impacts as the Proposed Action.

Hazardous Wastes. The Alternative Action would result in the same impacts as the Proposed Action.

Pollution Prevention. The Alternative Action would result in the same impacts as the Proposed Action.

Asbestos. The Alternative Action would result in the same impacts as the Proposed Action.

Lead-Based Paint. The Alternative Action would result in the same impacts as the Proposed Action.

Environmental Restoration Program. The Alternative Action would result in the same impacts as the Proposed Action.

Pesticides. The Alternative Action would result in the same impacts as the Proposed Action.

Radon. The Alternative Action would result in the same impacts as the Proposed Action.

Polychlorinated Biphenyls. The Alternative Action would result in the same impacts as the Proposed Action.

4.6.4 Cumulative Impacts

Hazardous Materials. Other planned projects may occur at Elmendorf AFB during the same period as the Proposed Action. As with the Proposed Action, it is anticipated that the quantity of products containing hazardous materials used during construction would be minimal, and their use would be temporary. Other projects would also be required to comply with installation procedures for the handling of hazardous materials. Therefore, hazardous material management would not be impacted by the Proposed Action or other planned projects at Elmendorf AFB.

Hazardous Wastes. Any hazardous waste generated as a result of the proposed demolition or construction would be properly contained, stored, and disposed by the construction contractor in accordance with applicable Alaska regulations and the appropriate Elmendorf AFB plans. Any increases in hazardous waste resulting from these other actions would not impact hazardous waste management at the Base because the installation would continue to comply with requirements and not be subject to additional regulatory requirements by the USEPA or the State of Alaska.

Pollution Prevention. As with the Proposed Action, the increased use of products containing EPA 17 and ODS chemicals, off-base transfers of hazardous waste, disposal of municipal solid waste, and consumption of energy would be minimal and temporary, and would not impact the ability of Elmendorf AFB to achieve the reduction goals specified in AFI 32-7080.

Asbestos. Any ACM encountered during demolition from the Proposed Action and other actions would be managed in accordance with established regulations and guidance, including the Elmendorf AFB AMP.

Lead-Based Paint. Any lead-based paint encountered during demolition for the Proposed Action and other planned projects would be managed in accordance with established regulations and guidance. No cumulative impacts would be expected.

Environmental Restoration Program. Ongoing remediation programs at ERP sites at Elmendorf AFB would not be affected by the demolition activities and the construction and occupancy of replacement housing. With coordination of planned projects with ongoing ERP activities, no cumulative effects would be expected.

Pesticides. Pesticide use and disposal from the Proposed Action and other actions would be managed in accordance with established regulations and guidance. No cumulative impacts would be expected.

Radon. Radon levels above the RAL would not be expected from the Proposed Action or other actions planned for Elmendorf AFB. No cumulative impacts would be expected.

Polychlorinated Biphenyls. Handling of PCB from the Proposed Action and other actions would be managed in accordance with established regulations and guidance. No cumulative impacts would be anticipated as a result of the Proposed Action.

4.6.5 Mitigation

Hazardous Materials. The use of products containing hazardous materials during the construction activities would be limited as part of the construction contract and monitored by inspectors. Therefore, no mitigation measures for improving hazardous material management would be required.

Hazardous Wastes. The generation of hazardous waste during demolition and construction activities would not exceed significance criteria requirements and would continue to be managed in accordance

with applicable regulatory requirements. Therefore, no mitigation measures for hazardous waste management would be required.

Pollution Prevention. The increased purchases of products containing ODS and EPA 17 chemicals, off-base transfers of hazardous waste, disposal of municipal solid waste, and consumption of energy during the proposed demolition and construction activities would not exceed significance criteria requirements. Therefore, no mitigation measures for achieving pollution prevention goals would be required.

Asbestos. No mitigation measures would be required.

Lead-Based Paint. No mitigation measures would be required.

Environmental Restoration Program. No mitigation measures would be required.

Pesticides. No mitigation measures would be required.

Radon. No mitigation measures would be required.

Polychlorinated Biphenyls. No mitigation measures would be required.

4.7 BIOLOGICAL RESOURCES

Effects on biological resources would be considered significant if the federal action: substantially diminished habitat for a plant or animal species; resulted an impact to threatened or endangered species; substantially diminished a regionally or locally important plant or animal species; interfered substantially with wildlife movement or reproductive behavior; resulted in a substantial infusion of exotic plant or animal species; or, resulted in detrimental effects on wetlands or floodplains.

4.7.1 Proposed Action

The Proposed Action would result in replacement of existing housing and the construction of new housing on Elmendorf AFB and Fort Richardson.

Elmendorf AFB. The replacement of existing housing would not result in any impacts to biological resources because the MFH areas are developed and do not provide high quality wildlife habitat.

Existing housing units in the Douglas, Boston and Seattle housing areas would be demolished and the vacant land returned to the Government (replacement housing would not be constructed at this location). Land returned to the Government would function as open space and provide an attraction to geese and other bird species. The newly-created vacant areas would be located within or adjacent to the Bird Exclusion Area (BEZ) associated with the airfield. To prevent bird-aircraft strike hazards, this land would be revegetated and managed in accordance with requirements identified in the Elmendorf AFB BASH Plan.

Construction of additional housing south of Cherry Hill MFH, adjacent to Boulder MFH, and adjacent to the FO/CO area would result in the loss of vegetation on undeveloped land.

Construction of housing on the Cherry Hill site would result in loss of 12.7 acres of disturbed, sparsely wooded vegetation that serves as marginal habitat for large mammals due to proximity to existing development. Although moose may occasionally wander through the site, loss of this area would not be expected to result in any detrimental effects on wildlife movement or reproduction behavior. Loss of 12.7 acres at this location would not substantially diminish habitat for plant or animal species because this acreage is located entirely within the developed Main Cantonment Area. This developed portion of the

installation represents 25 percent of the total acreage of the Base, with the remaining 75 percent of the Base subject to conservation management.

Housing in the existing Cherry Hill MFH will continue to experience bear-human conflicts. Undeveloped areas of Elmendorf AFB provide attractive habitat for both species of bears. Bear-human interactions occur at higher frequency where housing is adjacent to bear habitat, as is the case at Cherry Hill. Curiosity of bears and food scents emanating from housing tend to draw bears into or proximate to the housing area creating potentially dangerous conflicts. Some measures to minimize the attraction can be reached through:

- resident bear awareness education;
- a domestic solid waste management strategy that ensures the use of only bear-proof garbage receptacles outside the home;
- pet and yard care standards that prevent availability of pet and human food outside the home;
- songbird feeding standards that allow feeding only during periods of bear hibernation (October 15-April 15) (and outside the bird exclusion zone); and,
- an active enforcement program that ensures the above standards and State of Alaska regulations that prohibit the negligent feeding of bears (5 AAC 92.230. Feeding of Game) are followed by all residents.

Construction of housing on the site adjacent to Boulder MFH would result in loss of 11.02 acres of disturbed, grassy vegetation that generally does not provide wildlife habitat. The site is located adjacent to the existing New Sunflower MFH area.

Construction of housing on the site adjacent to the FO/CO area would result in loss of 5.27 acres of disturbed, grassy vegetation that generally does not provide wildlife habitat.

To minimize the potential for moose-human conflicts, landscaping for the housing areas will specify shrubs and plants that are low in moose palatability, and are in accordance with species approved in the Base landscape plan.

The Proposed Action would not result in any significant adverse impacts to threatened or endangered species, because no federally listed species are known to exist on Elmendorf AFB.

The Proposed Action would not affect any species of special interest, since keystone species on the Base occur only the forest or wetland ecosystems. The Proposed Action would not be expected to significantly diminish a regionally or locally important plant or animal species.

Upon completion of construction, the housing areas would be landscaped in accordance with the Architectural Compatibility Guidelines and Landscape Development Plan for Elmendorf AFB. The Proposed Action would not be expected to result in a substantial infusion of exotic plant or animal species.

The sites for construction of new housing are not located in any wetlands or floodplains. The Proposed Action would not be expected to result in significant adverse effects on wetlands or floodplains.

Fort Richardson. The Proposed Action would result in the lease of approximately 352 acres of land on Fort Richardson and the compensation of moose habitat at other locations on the installation and Elmendorf AFB. Housing would be constructed on approximately 70 percent of this parcel or approximately 247 acres of protected forest. Construction of housing and associated community facilities on the Fort Richardson property would result in the loss of dry forb herbaceous vegetation, ericaceous

dwarf scrub, open and closed needleleaf forest and disturbed areas. The loss of 352 acres of vegetation would represent 0.45 percent of the undeveloped land on Fort Richardson.

The Proposed Action would result in the loss of approximately 352 acres of winter range moose habitat. This comprises wildlife habitat in the broadleaf forest, needleleaf forest, and areas modified by humans. This area is estimated to support approximately 14 moose that reside in the antenna field and approximately 60 or more moose from areas in the surrounding Elmendorf AFB and Fort Richardson. Land within the 352 acres that is not developed into housing would provide habitat for several years but will no longer be managed for moose habitat to avoid moose-human conflicts.

Attracting moose to the proposed housing area is undesirable because this creates potentially dangerous human/pet-moose interactions. The Air Force would ensure that design of the housing area minimizes moose habitat value in plantings that surround the housing area. Species of plants used in landscaping must be undesirable to moose to avoid attracting moose to the houses.

To compensate for the loss of moose habitat, the Air Force would prepare and implement a Moose Habitat Compensation Plan in consultation with the U.S. Army and the Alaska Department of Fish and Game. The Plan would define replacement habitat sites and specify the appropriate management practices for moose habitat in the area south of Ship Creek. The following elements will be included in the Moose Habitat Compensation Plan:

- The Air Force would enhance a currently barren landfill and surrounding areas to provide future high quality moose habitat. Additional acres of moose habitat enhancement would be specified by location, acreage and treatment technique in response to a predetermined habitat replacement formula. The Air Force will work with agencies to determine the appropriate reduction in moose population that can be sustained on reduced availability of winter habitat. The design of the proposed road and bridge would include consideration of large wildlife passage and human safety in coordination with the U.S. Army and the Alaska Department of Fish and Game.

- The Air Force would follow land/timber management practices to optimize return of moose habitat. Replacement sites would be prioritized by proximity to the affected area, enhancement potential, and long term stability of the enhanced sites by land designation that discourages future construction. The quantity of replacement acreage will follow a predetermined formula based on quantity and quality of habitat lost.

- Moose habitat replacement would include the distribution of soils on the closed Elmendorf AFB landfill and surrounding acreage in accordance with recommendations in the 2003 Evapotranspiration Landfill Cover Feasibility Study. The soils would allow development of an evapotranspiration cover for the landfill as well as desirable moose habitat on the landfill and surrounding areas.

- The Air Force and U.S. Army would coordinate with Alaska Department of Fish and Game to set appropriate moose harvest levels for succeeding annual moose hunts on both installations. Temporary reduction of moose numbers will be necessary during the period that moose habitat is diminished.

- To minimize the potential for moose-human conflicts, landscaping for the housing area, road construction and associated activity areas would be restricted to shrubs and trees that have low moose palatability, and are in accordance with species approved by the Base landscape plan.

- Roadway right-of-ways would be wide enough and sloped appropriately for drivers to adequately spot and avoid moose or other large wildlife species crossing the road.

Construction of housing in the 352 acres would place housing within traditional bear habitat and adjacent to an important bear travel corridor which would likely create bear-human conflict issues. This area has historically provided attractive habitat for both species of bears. Bear-human interactions typically occur

at higher frequency where housing is adjacent to a primary bear travel corridor like the Ship Creek riparian zone. Curiosity of bears and food scents emanating from housing tend to draw bears into or proximate to the housing area creating potentially dangerous conflicts. Some measures to minimize the attraction can be attained through:

- resident bear awareness education;
- a domestic solid waste management strategy that ensures the use of only bear-proof garbage receptacles outside the home;
- pet and yard care standards that prevent availability of pet and human food outside the home;
- songbird feeding standards that allow feeding only during periods of bear hibernation (October 15-April 15) and outside the bird exclusion zone; and,
- an active enforcement program that ensures the above standards and State of Alaska regulations that prohibit the negligent feeding of bears (5 AAC 92.230. Feeding of Game) are followed by all residents.

Development of recreational trails in wooded areas adjacent to housing in the 352 acres is prone to place users in potentially dangerous situations with bears, especially brown bears which are more prone to become defensive. The Ship Creek riparian zone will continue to serve as an important bear travel corridor for both species of bears as well as moose. All species, when suddenly confronted at close range can become defensive and attack humans or their pets. Trails should not be developed within or paralleling the edge of the riparian zone (ADF&G). Trails that must cross the zone should cross perpendicular to the zone and near roadways, and trails should provide ample visibility for the user to identify wildlife using the trail at a safe distance.

While construction of housing would be concentrated in the area north of Bartlett High School, placement of a new road connecting the housing area is not expected to impede movement of wildlife south of the cantonment on Fort Richardson. Wildlife movement is already impeded by fencing along Glenn Highway that bisects existing moose winter range. Wildlife desiring to cross the highway is funneled through the underpass at Ship Creek. A roadway without a fence would not impede wildlife at that same level, thus existing wildlife movements would not be expected to change significantly by the proposed access road. Impediment to wildlife travel would likely be temporary and during periods of high traffic volume. Movement of moose through the seasonal ranges would be expected to continue, including movement in the winter range on both sides of the Glenn Highway.

The construction of housing would not result in any significant impacts to threatened or endangered species, because no federally listed species are known to exist on Fort Richardson.

Upon completion of construction, the housing areas would be landscaped in accordance with the Architectural Compatibility Guidelines and Landscape Development Plan for Elmendorf AFB. The Proposed Action would not be expected to result in a substantial infusion of exotic plant or animal species.

The sites for construction of new housing are not located in any wetlands. The property on Fort Richardson to be transferred abuts the 100-year stream bank. Areas that are considered wetlands associated with Ship Creek would be avoided (no construction of housing or community facilities would occur in wetlands). Placement of the new road from the hospital to Arctic Valley Road would require crossing of Ship Creek. Design of the proposed road would avoid or minimize encroachment into the riparian zone associated with Ship Creek. Design and construction of the roadway would be conducted in accordance with stipulations of the Corps of Engineers Section 404 permit. The Proposed Action would not be expected to result in significant adverse effects on wetlands or floodplains.

4.7.2 No Action Alternative

The No Action Alternative would not result in any demolition or construction activities at Elmendorf AFB. No change to biological resources would occur.

4.7.3 Alternative Action

The Alternative Action would result in the same effects to biological resources as the Proposed Action.

4.7.4 Cumulative Impacts

The ongoing loss of habitat for large mammals on Elmendorf AFB and Fort Richardson is considered an existing cumulative impact to biological resources. Security fencing at both installations, as well as relocation of the Hillberg horse stables have resulted in loss of habitat and effects on wildlife movement. Other planned projects may occur at Elmendorf AFB during the same period as the Proposed Action. As with the Proposed Action, each of these planned projects would be evaluated for impacts to biological resources. Other projects would also be required to comply with natural resource management practices. The Proposed Action would contribute to ongoing habitat loss on Elmendorf AFB and Fort Richardson. Compensation for habitat loss from construction of housing on the Fort Richardson property has been included in project planning. For this reason, the cumulative impact of the Proposed Action on biological resources would not be considered significant.

4.7.5 Mitigation

With the exception of a Moose Habitat Compensation Plan to be prepared by the Air Force, no mitigation measures would be required.

4.8 CULTURAL RESOURCES

Impacts on cultural resources would be considered significant if a federal undertaking would directly or indirectly impact archaeological resources, historic resources, or traditional cultural resources. The nature and potential significance of cultural resources in the potentially affected area was identified by considering the following definition. Historic properties, under 36 Code of Federal Regulations (CFR) Part 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP." For the purposes of these regulations this term includes, artifacts, records, and remains that are related to and located within such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet NRHP listing criteria. Therefore, sites not yet evaluated are considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

4.8.1 Proposed Action

The proposed replacement and construction of MHF units at Elmendorf AFB would require the demolition of existing units and construction of new units upon the same land, in addition to construction of housing on undeveloped land. Because the activity is considered to be facilities development and construction, this ground-disturbing activity may have a potential effect on subsurface cultural resources.

Upon transfer of land from Fort Richardson to Elmendorf AFB, the management of cultural resources on the proposed housing site on Fort Richardson would be accomplished in accordance with procedures in the Elmendorf AFB Integrated Cultural Resource Management Plan.

Archaeological Resources. The Proposed Action would involve ground-disturbance during demolition and construction, and may result in the inadvertent discovery of subsurface cultural materials on Elmendorf AFB and Fort Richardson. Damage to, or loss of any cultural artifacts would be considered a

significant impact. To avoid or minimize the potential for adverse impacts to cultural resources, the Air Force will ensure that the following best management practice is accomplished:

- In the event any previously undetected archaeological resources are discovered during earthwork, the construction contractor will be required to stop construction activities in the affected area and contact the Elmendorf AFB Cultural Resources Manager (CRM) or designate. The CRM will follow the procedures in Section 4.5.1 (Inadvertent Discovery of Archaeological Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the Council's publication, Treatment of Archaeological Properties.

Historic Resources. The Air Force is required to comply with existing legislation to ensure that properties that may qualify for inclusion on the National Register must not be inadvertently transferred, sold, demolished, substantially altered or allowed to deteriorate significantly (AFB 126-7:5). The Proposed Action would not be located in or near any of the three NRHP-eligible historic districts on Elmendorf AFB.

Ten of the 986 MFH units to be conveyed and potentially demolished or renovated are considered eligible for listing on the NRHP. These units, located in the Generals' Quad Residential District, have been extensively modified. The Air Force *Legacy Resource Management Program: Interim Guidance for Cold War Resources* (1993) indicates that support facilities like housing units are not regarded as having the potential for exceptional national importance in the context of the Cold War (Keane, et al., 1997). In accordance with the NHPA and 36 CFR 800, the Air Force will be preparing a Determination of Eligibility (DOE) for the MFH units to be conveyed for submittal to the Alaska SHPO as part of the Section 106 consultation process for this action. The Air Force will follow all SHPO requirements, as stipulated in a Memorandum of Agreement, to mitigate adverse effects to historic resources.

To avoid or minimize the potential for adverse impacts to historic resources, the Air Force will ensure that the following best management practices are accomplished:

- The Air Force will conduct National Historic Preservation Act (NHPA) Section 106 consultation to include an evaluation of the eligibility of the ten units in the Generals' Quad Residential District for inclusion on the NRHP. If eligible, an assessment of effect will be made. If adverse effects are found, then a Memorandum of Agreement will be developed to mitigate adverse effects.

- The Air Force will require that any renovations, rehabilitation, additions and/or modifications to housing units or structures in the Generals' Quad Residential District are conducted in compliance with Stipulation IV of the Draft Programmatic Agreement (Attachment 5.4 of the ICRMP). This shall include design of such renovations to conform to the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67), submittal of preliminary (35 percent) design information to the Alaska Office of History and Archeology (OHA), and compliance with 36 CFR Part 800, as required.

- The Air Force will require that any demolition of housing units or structures in the Generals' Quad Residential District are conducted in compliance with Stipulation V of the Draft Programmatic Agreement (Attachment 5.4 of the ICRMP). This shall include photodocumentation, recordation, and compliance with 36 CFR Part 800, as required.

- The Air Force would ensure that existing structures on the Fort Richardson property to be transferred to Elmendorf AFB are evaluated for historical significance.

For these reasons, the Proposed Action would not result in any significant adverse effects on historic resources.

Traditional Cultural Resources. The Proposed Action would not be located in any area that is in use by any federally recognized Alaska Native tribe. Impacts to traditional cultural resources would not be expected as a result of the Proposed Action. To avoid or minimize the potential for adverse impacts to traditional cultural resources, the Air Force will ensure that the following best management practice is accomplished:

- In the event that any Alaska Native human remains are encountered during construction, excavation will stop and the Elmendorf AFB Cultural Resources Manager will be notified immediately. The CRM will follow the procedures in Section 4.5.2 (Discovery of Human Remains) of the ICRMP and will then notify the SHPO and appropriate Alaska Native Groups.

4.8.2 No Action Alternative

Under the No Action Alternative, there would be no construction activities or change from the baseline conditions. Therefore, the No Action Alternative would have no impact on any cultural resources.

4.8.3 Alternative Action

The Alternative Action would result in the same effects as the Proposed Action.

4.8.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects involving construction on Elmendorf AFB and the surrounding area, as identified in Table 6. The Proposed Action could have the potential to cumulatively contribute to disturbances of previously undetected cultural material that may be present beneath the surface. However, with implementation of the best management practice identified herein, such impacts would be prevented or minimized. Therefore, the Proposed Action would not be expected to contribute to cumulative impacts on cultural resources.

4.8.5 Mitigation

No mitigation measures are required.

4.9 GEOLOGICAL RESOURCES

An impact to geological resources would be considered significant if it resulted in substantial erosion or if alteration of ground surface features occurred through activities such as excavation.

4.9.1 Proposed Action

Elmendorf AFB. Construction at Elmendorf AFB would occur within an area where the physiographic features and geologic resources have been previously disturbed and modified by prior construction of military family housing. Alteration of ground surface would be minimal compared to existing conditions. Therefore, impacts to physiography and geology would not be considered significant.

Soils at Elmendorf AFB should not present future development obstacles; however, there are isolated cases of soil erosion at the Cherry Hill outfall and other areas lacking storm water drainage systems. Construction would occur within an area in which the soils have been disturbed and modified by prior housing construction. Earthwork at these locations and at the undeveloped sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Installation of best management practices such as described in Subchapter 4.5.5 would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion. The Air Force would design and construct housing in accordance with recommendations in the geotechnical investigation to be prepared for the site. Therefore, impacts to soils would not be considered significant.

The Proposed Action may result in the removal of gravel during housing construction. In addition, backfill material may be required. The following best management practices would be accomplished as part of the Proposed Action:

- All backfill material would be obtained from existing pits on Elmendorf AFB (no new pits would be opened or otherwise required as a result of the Proposed Action).
- The Air Force would also ensure that a separate reclamation plan is prepared for the State of Alaska for any excavation of graven in any pit that exceeds 50,000 cubic yards per year.
- No metal, wood, demolition rubble or other material shall be placed in any borrow pits (concrete rubble is allowable).
- In the event any other material is placed in a borrow pit, the contractor would be required to remove this material and dispose of the material off-base.
- Excavated material from MFH construction sites would be used to backfill borrow pits wherever possible.

With implementation of best management practices, impacts to geologic resources on Elmendorf AFB would not be considered significant.

Fort Richardson. Construction of housing and roadways on Fort Richardson would occur within an area where physiographic features and geologic resources have generally not been modified by prior construction. Alteration of ground surface on the relatively flat site would be limited to clearing, excavation to shallow depths, and grading. Impacts to physiography and geology would not be considered significant.

Soils on the Fort Richardson site should not present future development obstacles in that erosion potential is low. Earthwork at these locations and at the undeveloped sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Installation of best management practices such as described in Subchapter 4.5.5 would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion. The Air Force would design and construct housing in accordance with recommendations in the geotechnical investigation to be prepared for the site. Therefore, impacts to soils would not be considered significant.

4.9.2 No Action Alternative

No ground disturbing activities would occur. Therefore, no impact to physiographic features and soils would be anticipated.

4.9.3 Alternative Action

Impacts to physiographic features and soils as a result of the Alternative Action would be the same as described for the Proposed Action.

4.9.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects involving construction on Elmendorf AFB, as identified on Table 5. Construction activity at Elmendorf AFB would occur in areas where the physiographic features and soils have been previously disturbed and modified by prior construction. The Proposed Action would not be expected to cumulatively contribute to impacts to geologic resources.

4.9.5 Mitigation

Mitigation measures would not be required.

4.10 INFRASTRUCTURE AND UTILITIES

Impacts to infrastructure and utility systems would be considered significant if the federal action substantially increased the demands on the utility systems, resulting in the need for additional capacity or new facilities.

At full buildout, the Proposed Action would result in a net increase of 208 housing units over baseline conditions. However, the number of military members housed on the Base would vary from year-to-year depending on the number of units that would require renovation.

4.10.1 Proposed Action

Water Supply. The Proposed Action would result in a net increase in water consumption from the additional 208 housing units that would be added to the inventory of housing on Elmendorf AFB. It is expected that increase in consumption of domestic water would be offset by the decommissioning of the Base steam plant. This increase in consumption would not be expected to result in any significant impact on the ability of the Fort Richardson water supply system to provide potable and domestic water.

Wastewater Treatment. The increase in wastewater that would be generated from the additional 208 housing units would be treated in the Municipality of Anchorage treatment plant. This increase in wastewater would not be expected to result in any significant impact on the treatment system in Anchorage. Although the wastewater treatment system is adequate to meet future needs, the Air Force would consider long-term improvements to the wastewater treatment system associated with Base development and growth, and perform routine analyses to detect leaks, infiltration or system failure.

Storm Water Management. The Proposed Action would result in no substantial change to the existing storm water system within the existing MFH areas on Elmendorf AFB. The Proposed Action would result in the need for new storm water systems at the undeveloped sites where housing would be constructed (south of Cherry Hill MFH, adjacent to Boulder MFH, and Fort Richardson property to be transferred to Elmendorf AFB). The Proposed Action would include improvements to surface and storm drainage systems as part of the housing area design. The Air Force would continue to prevent roadway and facility deterioration that could result from improper storm water drainage. The Air Force would identify areas essential to the management of snow removal and storm water drainage systems, and preserve such areas, in planning for Base development and growth. For this reason, impacts to storm water management would not be expected as a result of the Proposed Action.

Natural Gas. The Proposed Action would result in an increase in consumption of natural gas for the 208 additional housing units that would be constructed on the Fort Richardson property to be transferred to Elmendorf AFB. This increased consumption would not be expected to result in any significant impact on the ability of the local service provider to supply natural gas. The new housing units would include energy conservation techniques and energy efficient equipment to achieve reductions in natural gas consumption. This energy consumption reduction would enhance the ability of Elmendorf AFB to achieve the reduction goals specified in AFI 32-7080. For these reasons, impacts to natural gas would not be expected as a result of the Proposed Action.

Electricity. The Proposed Action would result in an increase in electricity consumption as a result of the 208 additional housing units. The Base power plant is nearing capacity and is augmented by Anchorage Municipal Light and Power. The Air Force will continue its study of power alternatives to identify options for providing adequate electrical power for the future. The new housing units would include energy conservation techniques and energy efficient equipment to achieve reductions in electricity consumption. This energy consumption reduction would enhance the ability of Elmendorf AFB to meet the energy

efficiency objectives of Executive Order 13123 and energy conservation goals of AFI 32-7080. Base consumption of electricity would continue to be improved with implementation of ESPC projects. With implementation of best management practices, this increased consumption would not be expected to result in any significant impacts to the energy system.

Solid Waste Management. The solid waste generated from the construction and demolition activities would result in construction debris being disposed in the Anchorage Regional Landfill. In considering the basis for evaluating the significance of impacts on solid waste, several items were considered. These items include evaluating the degree to which the Proposed Action waste generation could affect the existing solid waste management program and the capacity of the area landfill. Analysis of the impacts associated with the proposed demolition and construction activities is based on the following assumptions:

- The weight of concrete debris is 150 lb/ft^3 (Merritt, 1976);
- The weight of asphaltic concrete roadways is 130 lb/ft^3 (AI, 1983);
- Approximately 4 pounds of construction debris is generated for each square foot of floor area for new structures (Davis, 1995);
- Approximately 92 pounds of demolition debris is generated for each square foot of floor area of demolished structures (USACE, 1976);
- Approximately 96 pounds of demolition and construction debris are generated for each square foot of floor area of renovated structures;
- Approximately 1 pound of construction debris is generated for each square foot of new asphaltic concrete pavement;

Type IV solid waste would be generated from implementation of the Proposed Action. These wastes would consist of building debris and construction materials such as concrete, metals (i.e., roofing, reinforcement bars, conduit, and piping), fiberglass (i.e., roofing materials and insulation), cardboard, plastics (PVC piping, packaging material, and shrink wrap), and lumber. These materials would be placed in the appropriate construction materials landfill. These wastes would be in excess of the solid municipal wastes generated by Base personnel.

Solid waste generated from the Proposed Action will be managed to include bear-proof trash containers and other measures to avoid attracting bears and moose.

The Proposed Action would generate approximately 11,615 tons per year of solid waste (over four years) from the construction of new facilities, demolition of structures and the construction of new pavement surfaces. The exact amount of debris that would be disposed of in a landfill is unknown because the contractor will recycle material to the maximum extent practicable. Demolition, inert wastes and refuse generated by the Proposed Action would be transported to an off-base landfill that is permitted to accommodate planned waste disposal. Impacts to solid waste management would not be expected from the Proposed Action.

At full buildout, the Proposed Action would result in generation of solid waste from the additional 208 housing units that would be constructed on Fort Richardson property to be transferred to Elmendorf AFB. The local landfill has sufficient capacity to accommodate disposal needs for future years. For this reason, the Proposed Action would not result in any impact to solid waste management.

4.10.2 No Action Alternative

Water Supply. The No Action Alternative would result in no change to baseline conditions.

Waste Water Treatment. The No Action Alternative would result in no change to baseline conditions.

Storm Water Management. The No Action Alternative would result in no change to baseline conditions.

Natural Gas. The No Action Alternative would result in no change to baseline conditions.

Electricity. The No Action Alternative would result in no change to baseline conditions.

Solid Waste Management. The No Action Alternative would result in no change to baseline conditions for solid waste generation.

4.10.3 Alternative Action

Water Supply. The Alternative Action would result in impacts similar to the Proposed Action.

Waste Water Treatment. The Alternative Action would result in impacts similar to the Proposed Action.

Storm Water Management. The Alternative Action would result in impacts similar to the Proposed Action.

Natural Gas. The Alternative Action would result in impacts similar to the Proposed Action.

Electricity. The Alternative Action would result in impacts similar to the Proposed Action.

Solid Waste Management. The impacts to solid waste generation that would result from the Alternative Action would be similar to the Proposed Action. With implementation of the Alternative Action, approximately 16,371 tons per year of solid waste (over four years) would be generated by construction of new facilities, demolition of structures and the construction of new pavement surfaces. This value reflects the increased amount of debris generated by renovation of existing housing units. The exact amount of debris that would be disposed of in a landfill is unknown because the contractor will recycle material to the maximum extent practicable. Demolition, inert wastes and refuse generated by the Alternative Action would be transported to a permitted, off-Base landfill. Impacts to solid waste management would not be expected from the Alternative Action.

4.10.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects involving construction on Elmendorf AFB, as identified in Table 6. The Proposed Action would not be expected to cumulatively contribute to adverse effects on infrastructure or utility systems.

Disposal of demolition and construction debris from the other actions would increase the disposal rate at the off-Base landfill over the four-year period, however this increase would not be considered substantial. It is assumed the contractor would recycle materials to the maximum extent possible, thereby reducing the amount of construction and demolition debris disposed in the landfill. However, the exact amount of debris cannot be estimated at this time. Disposal of construction and demolition debris from the Proposed Action and other actions would not significantly reduce the life expectancy of the landfill.

4.10.5 Mitigation

No mitigation measures are required.

4.11 TRANSPORTATION SYSTEMS

An impact to transportation systems would be considered significant if it resulted in the need for new or increased government services, or if the action resulted in traffic conditions that would be considered unacceptable.

The proposed Phase II PSF housing project would result in conveyance of MFH units on Elmendorf AFB to a contractor for operations and maintenance. As part of the Proposed Action, a new road connecting Elmendorf AFB to Fort Richardson would be constructed to provide access for occupants of an additional 208 housing units that would be constructed on property to be transferred to Elmendorf AFB (see Figure 6). For this reason, potential impacts to off-base and on-base transportation systems are evaluated in this subchapter.

4.11.1 Proposed Action

Elmendorf AFB. The Proposed Action may result in temporary and localized traffic increases at specific housing construction areas on Elmendorf AFB. Temporary increases in traffic could result from the presence of construction vehicles. During construction, temporary detours may occur although no road closures would be expected. These conditions would not be expected result in any substantial change to existing traffic patterns or volumes on Elmendorf AFB.

Occupancy of Phase II PSF housing on Elmendorf AFB would not result in impacts to transportation systems because units would be located in housing areas currently served by existing roadway network. No net change in the number of housing units would result.

Fort Richardson. Temporary and localized traffic would also be expected on the Fort Richardson property. Construction vehicles would access the work site via Provider Drive and the Glenn Highway. In order to avoid potential traffic conflicts, the Air Force would ensure that Bartlett High School and DoD/VA Hospital are notified of the construction schedule.

The additional 208 housing units on Fort Richardson property would result in additional traffic associated with occupancy of the new units. The proposed housing area would be served by a new roadway connecting Elmendorf AFB north of the DoD/VA Hospital to Arctic Valley Road on Fort Richardson. The proposed road would be a government-owned road designed to accommodate sufficient traffic flow between the installations. Adequate access to the proposed housing units would be provided.

As a best management practice, the Air Force would coordinate design and construction of the proposed road with Municipality of Anchorage Planning, Development and Public Works and the U.S. Department of Transportation (Federal Highway Administration) to ensure that the Glenn Highway can accommodate future traffic flows on roadways, intersections and ramps.

4.11.2 No Action Alternative

The Proposed Action would not result in any change to baseline conditions.

4.11.3 Alternative Action

The Proposed Action would result in the same impacts to transportation systems as described for the Proposed Action.

4.11.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects on Elmendorf AFB, as identified in Table 6. Each of these other actions would be required to evaluate the effects of the action on transportation systems. The Air Force is in the process of upgrading Base roads and intersections to

accommodate ongoing growth and maintenance conditions. The Proposed Action would not be expected to cumulatively contribute to impacts on transportation systems.

4.11.5 Mitigation

No mitigation measures are required.

4.12 PUBLIC SERVICES

An impact to public services would be considered significant if it resulted in the need for new or increased government services.

The proposed Phase II PSF housing program would result in conveyance of MFH units to a contractor for operations and maintenance. Although it is expected that Elmendorf AFB housing would be occupied by military personnel and their families, it is also possible that eligible, non-military tenants could occupy the housing when the units are no longer needed by the Base (see Subchapter 2.3.8). It is expected that the housing contractor would manage the MFH areas by continuing services from the Air Force. It is also possible that public services could be provided by the local community. The timing and number of non-military tenants that may require local services in the future cannot be determined. For this reason, potential impacts to off-base and on-base public services are evaluated in this subchapter.

4.12.1 Proposed Action

The Air Force would coordinate any future proposed changes in public services needs with the appropriate local police and fire protection agencies as well as emergency medical service providers.

Police. The Proposed Action would result in an increase of 208 MFH units on Elmendorf AFB after transfer of property from Fort Richardson and final build-out of the parcel. It is expected that police protection services would continue to be provided by either the 3rd Mission Support Group or a contractor. This increase in housing units would not be expected to result in any significant impact on the ability of the 3rd Mission Support Group to provide security services. In the event that housing is subsequently occupied by non-military tenants, it would be expected that police protection services would continue to be provided by Base Security. It is not anticipated that Base housing would be included in the service area of the Anchorage Police Department due to access constraints and resource limitations (Miller, 2002). Based on this assumption, the Proposed Action would not result in any significant impact on the ability of the Anchorage Police Department to provide protection services within its service area.

Fire Protection. It is expected that fire protection services would continue to be provided by the Elmendorf AFB Fire Department. In the event that housing is subsequently occupied by non-military tenants, it would be expected that fire protection services would continue to be provided by the Elmendorf AFB Fire Department. It is not anticipated that Base housing would be included in the service area of the Anchorage Fire Department due to access constraints and resource limitations (Susman, 2002). Based on this assumption, the Proposed Action would not result in any significant impact on the ability of the Anchorage Fire Department to provide fire protection services within its service area.

Medical Services. The Proposed Action would result in an additional 208 families that would require hospital and medical clinic services. The increase in military personnel would not be expected to result in any significant impact on the ability of the DoD/VA Hospital on Elmendorf AFB to provide such services. In the event that the housing areas are subsequently occupied by non-military tenants, emergency medical services would not be provided by the Anchorage Fire Department. Non-military tenants would be required to arrange for medical services from the Base Hospital, the Anchorage Regional Hospital or other local medical facilities. The Proposed Action would not be expected to result in any significant impact on the ability of the local medical facilities to provide medical services in the area.

4.12.2 No Action Alternative

Police. The No Action Alternative would not result in any change to baseline conditions.

Fire Protection. The No Action Alternative would not result in any change to baseline conditions.

Medical Services. The No Action Alternative would not result in any change to baseline conditions.

4.12.3 Alternative Action

Police. The Alternative Action would result in the same impacts as the Proposed Action.

Fire Protection. The Alternative Action would result in the same impacts as the Proposed Action.

Medical Services. The Alternative Action would result in the same impacts as the Proposed Action.

4.12.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects on Elmendorf AFB, as identified in Table 6. Each of these other actions would be required to evaluate the effects of the action on public services. The Proposed Action would not be expected to cumulatively contribute to impacts on police protection, fire protection or medical services.

4.12.5 Mitigation

No mitigation measures are required.

4.13 SAFETY

The elements of the action with a potential to affect safety are evaluated relative to the degree to which the action increases or decreases safety risks to Base personnel, the public and property. Impacts to safety would be considered significant if the action resulted in a substantial increase in safety risk.

4.13.1 Proposed Action

Elmendorf AFB. The Proposed Action would not result in any increase in the safety risk because housing would continue to be located in existing locations on Elmendorf AFB.

Fort Richardson. The housing that would be constructed on the Fort Richardson property to be transferred would be located in proximity to antenna fields and ammunition storage areas. The electric and magnetic fields (EMF) generated by antennas is typically a concern to residents. The strength of electric and magnetic fields decreases with distance from the source. Evidence concerning health risks from exposure to magnetic fields is inconclusive at this time. After 30 years of research, health hazards associated with EMF has not been demonstrated. No federal or State laws limit the level of EMF in residences or the amount to which a person can be exposed; however, EMF health risks should be considered in new housing developments.

The antenna field north of the subject property has directional antennas (signals are emitted in a specific direction as opposed to being emitted in a radial direction). These antennas emit signals away from the proposed site. Therefore, EMF is not considered to be a safety risk to the proposed housing.

The proposed housing area on Fort Richardson would be located within one mile of ammunition storage areas. These areas are located approximately 0.5 miles north of Ship Creek. Ammunition areas are managed by the Army in accordance with DoD safety standards for ordnance storage. These standards apply to DoD ammunition and explosives facilities, and are designed to provide protection against serious

injury, loss of life and damage to property. Housing would not be sited within any explosive safety arcs as defined by DoD guidance. The ammunition storage areas are not considered to be a safety risk to the proposed housing area.

The primary response to nuisance, injured or dangerous wildlife on the Fort Richardson property would become the responsibility of 3 CES and the Elmendorf AFB military conservation agents upon land transfer.

4.13.2 No Action Alternative

The No Action Alternative would not result in any change to baseline conditions.

4.13.3 Alternative Action

The Alternative Action would result in the same impacts as the Proposed Action.

4.13.4 Cumulative Impacts

The Proposed Action is one of a number of other planned projects on Elmendorf AFB, as identified in Table 6. Each of these other actions would be required to evaluate the effects of the action on safety considerations. The Proposed Action would not be expected to cumulatively contribute to safety risks.

4.13.5 Mitigation

No mitigation measures are required.

4.14 INDIRECT IMPACTS

While direct environmental effects are caused by the action and occur at the same time and place as the action, indirect effects are those effects caused by the action that occur at a later time or are farther removed in distance from the action but are still reasonably foreseeable. As defined in 40 CFR Part 1508.8, indirect effects may include growth inducing effects and other effects related to the induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. The Proposed Action would result in a net increase of 208 housing units that would be constructed on property to be transferred to Elmendorf AFB. The Proposed Action would result in conveyance of housing units to a contractor for long-term operation and maintenance. In the future, these units could be occupied by eligible, non-military tenants if not required for military personnel. The availability of additional housing units to the general public would not be expected to result in any indirect effects associated with population growth or land use.

4.15 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Section 102(2)(C)(ii) of NEPA requires Federal agencies to identify any adverse environmental effects that cannot be avoided should the Proposed Action be implemented.

Unavoidable impacts would result from the implementation of the Proposed Action. However, these impacts would not be considered significant:

- Noise from demolition and construction activities would occur. This increase in noise level would be short-term and limited to the immediate area of construction. Noise-generating activities would take place during daytime hours and would be at levels that would not cause hearing impairment.

- The emission of air pollutants associated with demolition and construction would be an unavoidable condition, but is not considered significant.

- The loss of aggregate used for concrete, which would become inaccessible, would occur as a result of the construction activities. However, the impact would be insignificant due to the relatively small amount needed and the local availability of this resource.

- The use of nonrenewable energy resources is an unavoidable, but the amount used would not be considered significant.

One unavoidable impact to biological resources on Fort Richardson would occur:

- On Fort Richardson, site grading would remove vegetation and habitat for wildlife that includes moose. The Proposed Action would include enhancement of barren areas (i.e., landfills on Elmendorf AFB that are scheduled to be closed) for future use as moose browse (see Subchapter 4.7.1).

With incorporation of appropriate design features into the project, unavoidable impacts to biological resources would not be considered significant.

4.16 RELATIONSHIP BETWEEN SHORT-TERM USES AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Section 102(2)(C)(iv) of NEPA requires Federal agencies to identify the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity.

The Proposed Action would not result in an intensification of land use on Elmendorf AFB. Development of the Proposed Action would result in a loss of up to approximately 29 acres of open space on Elmendorf AFB. This open space is entirely within the developed Main Cantonment Area of the Base, and would result in consolidation of new housing with the existing housing areas. Therefore, the Proposed Action and the Alternative Action would not be expected to result in any cumulative land use or aesthetic impacts. Long-term productivity at Elmendorf AFB would not be affected by the Proposed Action.

The Proposed Action would result in an intensification of land use on Fort Richardson. Development of the Proposed Action would result in a loss of up to approximately 352 acres of open space on Fort Richardson. This open space is an Army training area that has been designated for future housing. Therefore, the Proposed and Alternative Action would not be expected to result in any cumulative land use or aesthetic impacts to Fort Richardson. Long-term productivity at Fort Richardson would not be affected by the Proposed Action.

4.17 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Section 102(2)(C)(v) of NEPA requires Federal agencies to identify any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented. This could include the consumption of material resources, energy resources, and human resources. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the use of these resources would have on consumption or destruction of a resource that could not be replaced in a reasonable period of time.

The irreversible environmental changes that would result from implementation of the Proposed or Alternative Action involve the consumption of material resources, energy resources, and human resources. The use of these resources is considered to be permanent.

Material resources used for the Proposed Action include building materials (for construction), concrete for the house slabs, driveways, and sidewalks, asphalt for the streets, and other various materials. The materials that would be consumed are not in short supply and are readily available from suppliers in Alaska. Use of these materials would not limit other unrelated construction activities, and therefore, would not be considered significant.

Energy resources would be irretrievably lost. These include petroleum-based products such as gasoline and diesel fuel, natural gas and electricity. During construction, gasoline and diesel fuel would be used for operation of the construction equipment and other vehicles. Electricity would be used in the units upon occupancy. However, because the units would be more energy efficient than those replaced, consumption of electricity would be expected to decrease. The Proposed Action would result in a net increase of 208 housing units as compared to the baseline conditions. Consumption of these energy resources would not place a significant demand on their availability in Alaska. Therefore, no significant impacts would be expected.

The use of human resources for construction is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

CHAPTER 5
LIST OF PREPARERS

This chapter provides the names and qualifications of staff members who were primarily responsible for preparation of this EA. This list includes the key management personnel, investigators and technical personnel that contributed to document preparation.

Name	Degree	Professional Discipline	Years of Experience
Crisologo, Rosemarie	B.S., Biological Sciences M.S., Environmental Engineering	Environmental Science	21
Gaddi, Elvira, P.E.	B.S., Chemical Engineering M.S., Chemical Engineering	Environmental Compliance	25
Schnapp, Angela	B.S. Nuclear Engineering M.S. Environmental Engineering	Environmental Engineering	9
Wallin, John	B.A., Biology M.A., Management	Environmental Science	27
Wooten, R.C.	Ph.D., Ecology/Biology	Environmental Science	31

CHAPTER 6
CONSULTATION AND COORDINATION

This chapter describes the consultation process undertaken by the Air Force for development of this Environmental Assessment. This chapter lists the individuals consulted during the preparation of this EA, the public review process for the Draft EA, and issues raised by the community and government agencies during the public review of the Draft EA. Air Force responses to comments received are also included in this chapter.

6.1 PERSONS AND AGENCIES CONSULTED

6.1.1 Federal Agencies

U.S. Air Force

Air Force Center for Environmental Excellence

Lynch, Nicholas, Capt (AFCEE/HDP)

Elmendorf AFB, Alaska

Payne, Valerie (3 CES/CEVP)
Walters, Kenneth (3 CES/CEI)
Miller, Bernard (3 CES/CEI)
Edwards, Paul, Capt (3 CES/CEI)
Griese, Herman (3 CES/CEVP)
Roberts, Beverly (3 CES/CEH)
Fleck, Hugh R. (3 CES/CEHF)
Million, Steven K. (3 CES/CEH)
Nyholm, Dick (3 CES/CECD)
Thomasson, Marvin (3 CES/CECD)
Thomas, Doris (3 WG/PA)
Baumler, Donna (3 CES/CEVR)
Marchand, Scott (3 WG/JA)
Miller, James (3 CES/CEVQ)
Scudder, Jon (3 WG/PA)
Williamson, Joseph (3 CES/CEVR)

U.S. Army

U.S. Army Alaska, Directorate of Public Works

Gardner, Kevin (Environmental Planner)
Quirk, William A., III (Environmental Scientist/Biologist)
Ruszkowski, Tom (GIS Specialist)
Anderson, Kirsten (Cultural Resources Specialist)
Epps, Sarah (Historian)

U.S. Army Garrison, Alaska

Formoso, Daniel J. (S&K Technologies, Inc., DPW Strategic Planning Cell)
Thorson, Olaf H. (Real Property Accountable Officer)

6.1.2 Local Agencies

Anchorage Fire Department

Miller, Bill (Deputy Chief)

Anchorage Police Department

Susman, Ginger (Chief's Office)

6.1.3 Other

Enstar Natural Gas Company

Lee, Jane

6.2 PUBLIC REVIEW PROCESS FOR THE DRAFT EA

The Air Force published a notice in the Anchorage Daily News on March 1 and 3, 2004 to invite the public to an Open House and Public Comment Meeting for the Draft EA. The Open House and Public Comment Meeting was held on Wednesday, March 3, 2004 at 6 p.m. at the Residence Inn, 1025 E. 35th Street in Anchorage, Alaska. Approximately 12 persons from the community attended this public meeting. No verbal comments were received by the Air Force at the meeting (only written comments were received). The public review period for the Draft EA took place from March 1, 2004 to March 30, 2004.

In addition to the public comment meeting, the Air Force issued a press release concerning the project on February 25, 2004. News articles on the project were published in the Anchorage Daily News on March 3 and 28, 2004. A news article was also published in the Anchorage Star on March 4, 2004. Media interviews regarding the project were conducted by the Alaska Public Radio News, KTUU-TV2 and KTVA-TV11 on March 2 and 3, 2004.

6.3 COMMENTS RECEIVED BY THE AIR FORCE

The Air Force received a total of 28 written comment letters on the Draft EA for Phase II PSF housing on Elmendorf AFB as follows:

- Letters were received via surface mail (12), facsimile (1), or electronic mail (15).
- Letters were received from three government agencies, three community groups and 20 individuals.
- Letters from government agencies were received from the U.S. Army Garrison – Alaska, the Alaska Department of Environmental Conservation, and the Alaska Department of Fish and Game.
- Letters from community groups were received from the North East Community Council, Scenic Foothills Community Council and the Nordic Skiing Association of Alaska.
- Letters from individuals included ten teachers or staff from Bartlett High School and 11 trail users (not including some of the Bartlett High School teachers/staff who are also trail users).

The source of comment letters are shown on Table 20. The environmental subject that received the most comments was potential impacts to the trails north of Bartlett High School. The number of comment letters received for environmental resource areas, and specific environmental issue areas raised, are shown on Tables 21 and 22.

Table 20. Comment Letters Received by the Air Force

No.	Source	Date of Letter	Form
1	U.S. Army Garrison – Alaska (Wes Layton, William Quirk and Dr. Mark Prieksat)	12 Feb 04	Electronic
2	Mary Pomeroy	24 Mar 04	Mail
3	John Schmitz	30 Mar 04	Electronic
4	Mary Henderson	30 Mar 04	Electronic
5	Shelley Schroeder	29 Mar 04	Electronic
6	John Conrad	29 Mar 04	Electronic
7	Wade Jerdee	(undated)	Electronic
8	Peter Tyron/Mary McKean	(undated)	Electronic
9	Nordic Skiing Association of Alaska (Gordon Wetzel)	18 Mar 04	Mail
10	Richard Mylius/Sally Gilbert	24 Mar 04	Mail
11	Sheila Reilly	19 Mar 04	Mail
12	Dede Schwartz	22 Mar 04	Mail
13	Tiger Demers	22 Mar 04	Mail
14	Louis Howard	30 Mar 04	Electronic
15	Alaska Department of Fish and Game (Jessy Coltrane)	24 Mar 04	Mail
16	Marian and Don Richter	22 Mar 04	Mail
17	Wm. Dwayne Adams, Jr.	25 Mar 04	Mail
18	Diane Holmes	23 Mar 04	Mail
19	Nicole Kimball	19 Mar 04	Mail
20	Jane Burri	24 Mar 04	Mail
21	Nordic Skiing Association of Alaska (Jim Burkolder)	8 Mar 04	Electronic
22	Marcus Doerry	31 Mar 04	Electronic
23	Northeast Community Council (Rod McCoy)	1 Apr 04	Electronic
24	Scenic Foothills Community Council (Roger Shaw)	1 Apr 04	Fax
25	Roseanne Thornley	3 Apr 04	Electronic
26	Chris Tomsen	7 Apr 04	Electronic
27	Russell Hood	29 Mar 04	Electronic
28	Derek Hagler	29 Mar 04	Electronic
	Total No. of Letters		28

Table 21. Summary of Comments Received During the Public Review Period

Description	Letters Received
a. Subject of Comments	
Trails	20
Trails and Associated Fencing	2
Trails and Other Concerns (see note a.)	3
Bear/Human Conflicts	1
Finalizing of the EA	1
U.S. Army comments (see Table 22)	1
Total No. of Letters	28

[a] Other comments included: extension of the public review period for the Draft EA, inadequate notification of availability of the Draft EA, Extension of length of Army tours, and access/distance to health/family support services

Table 22. U.S. Army Garrison – Alaska Comments on the Preliminary Draft EA

Subject	Issue
NEPA Issues	▪ Alternatives to the Proposed Action ▪ Cumulative impacts ▪ Mitigation
Project Design	▪ Access road ▪ Sewer line connection ▪ Presence of tanks at pump house ▪ Ammunition storage area ▪ Transfer of standby water wells ▪ Fencing of the housing area ▪ Bridge construction
Biological Resources	▪ Floodplains ▪ Moose habitat/compensation of habitat loss
Air Quality	▪ Emissions from new housing units ▪ Construction emissions ▪ Permit requirements ▪ Climate
Water Resources	▪ Water quality of Ship Creek ▪ Water supply ▪ Abandoned channel of Ship Creek ▪ Groundwater wellhead protection
Public Services	▪ School enrollment
Utilities	▪ Capacity of utility services
Noise	▪ Placement of housing under runway patterns
Land Use	▪ Recreational use of land for north of Bartlett High School ▪ Use of wheeled/tracked vehicles on Army land ▪ Aesthetic impacts
Hazardous Waste/Hazardous Materials	▪ Site contamination ▪ Lead-based paint management
Traffic	▪ Traffic Management Plan ▪ Traffic from new access road

6.4 AIR FORCE RESPONSES TO COMMENTS RECEIVED

The Air Force has reviewed and considered each of the comments on the Draft EA received from the community and government agencies. This subchapter provides responses prepared by the Air Force to these comments.

6.4.1 Potential Loss of Ski Trails (Air Force Response to Letters 2 through 13, and 16 though 28)

Summary of Comments: The 352-acre parcel of property north of Bartlett High School and the Alaskan Native Heritage Center is currently Fort Richardson property. An inter-military land transfer is underway to transfer ownership to the Air Force. In turn, the Air Force intends to develop the property for housing as part of its housing privatization initiative. The Air Force understands that the housing project, although completely upon military property, may affect not only the neighbors adjacent to the parcel, but also the community at large. The Air Force has considered the needs of the community and weighed against the mission and best interests of the military. The Air Force has been openly communicating with the public concerning this housing project and has held one-on-one dialogues with neighbors. These meetings have been productive, and the Air Force has developed recommendations in consideration of input from all parties.

Concerning the ski trails, the Air Force received input from the parties listed above. The primary concerns associated with ski trails are as follows:

- Bartlett High School Athletics will lose "about 1 km of the 5 km system since that is how much is on military land" that would be cut-off if the base boundary is fenced.
- The overall integrity of the trail system would be destroyed upon the loss of the 1 km of trail
- Potential for loss of lighted trails
- Trails have provided many years of enjoyment and are a valuable asset to the community
- If the 1 km of trail must be lost, request that there be compensation in the form of additional new trails or equivalent monetary consideration.

Air Force Response: The Air Force has taken each of these issues into consideration during project design and planning. The Air Force considered leaving openings in the proposed fence, placing the new fence north of the military property line (leaving military land outside of the fence), and placing the fence along the property line. The Air Force proposes to install a fence along the existing property line.

The Air Force cannot support openings in the fence for obvious force protection reasons. Elmendorf AFB is not an open base. Allowing the community access to the base via interconnected trails poses considerable risk to the Air Force. The proposed housing area would primarily serve the youngest, junior enlisted families who will likely have young children. These military members must be provided housing in a secure, on-base neighborhood. Openings in the fence would compromise the safety of this housing community.

The Air Force would develop a 150-foot buffer zone in the housing area. This zone would require a natural, undisturbed barrier between the property line and the housing development. Placing a fence anywhere but on the property line would leave military property outside of the fence and could incur liability for the Air Force. The Air Force would lose control of areas developed outside the fence. This would jeopardize the 150-foot buffer zone. Lastly, the Air Force requires the land for the buffer zone and cannot justify losing up to approximately 22 acres associated with a buffer zone outside of the fence.

Therefore, the interests of the Air Force and its junior members residing in the new housing area are best served by placing a fence along the existing property line. The existing portion of the trails on Air Force property would no longer be part of the looped trail. The Air Force would clear a wide path for fence installation, thereby enabling reconnection of the trails along the fence-line to a width that can accommodate typical recreational equipment, presuming the property owner (Bartlett High School or the Alaska Native Heritage Center) would approve these changes. An Air Force survey using on-site measurements and Geobase mapping noted two loops that encroach onto military property. The smaller inner loop has been formally mapped by the Nordic Skiing Association of America and contains approximately 1,700 feet of trail on military land. The outer loop, while not mapped by the Nordic Skiing Association of America includes approximately 2,400 feet of trail on military land. The Proposed Action would replace these loops with the fence-line trail that would include approximately 1,500 feet of new trail (reconnecting the inner loop) and about 1,900 feet of trail (reconnecting the outer loop). The resultant trails may be shorter because there would be less available land upon which recreational activities can continue. The trail on the military land is not lighted, so there would be no impact on lighting.

6.4.2 Comments from the Community and Government Agencies

Table 23 provides Air Force responses to the issues raised by the community and government agencies (Letters 2 though 26).

Table 23. Air Force Responses to Community Comments on the Draft EA

Comment	Responds to Letters No.	Air Force Response
Trails	2 through 13, 16 through 28	(See Subchapter 6.4.1)
Trails and Associated Fencing	11 and 19	The Air Force would install fencing at the existing property line.
Request for extension of the public review period for the Draft EA	23 and 24	The Air Force will not be extending the public review period for the Draft EA. However, the Air Force did accept comments on the Draft EA one week after the close of the comment period.
Inadequate notification of the project	24	The Air Force has published a notice in the local paper, and provided television and radio coverage, in order to inform the community. The Air Force has also met with community members to obtain input. This input has been given consideration in the planning process for the housing project.
Extension of length of Army tours	26	This subject is not relevant to the Environmental Assessment.
Adequate lighting of trails	26	The existing trail is not currently lighted. Therefore, the action would not result in any impacts to lighting.
Access/distance to health/family support services	26	The siting of the proposed housing has taken access/distance to community services into consideration, as discussed in Subchapter 2.1 (selection criteria for housing sites).
Bear/Human Conflicts	15	The Air Force will require that all housing areas be managed to avoid attracting bears. Garbage receptacles outside the home in housing areas will be bear-proof.
Finalizing of the EA	14	The Draft EA is not considered to be the Final EA. The Air Force has reviewed all comments received on the Draft EA prior to preparing a Final EA, which would be approved via a Finding of No Significant Impact (FONSI).

6.4.2 Army Comments

Summary of Comments: Air Force responses to U.S. Army Garrison - Alaska comments (Letter No. 1) are provided on Table 24.

Table 24. Air Force Responses to U.S. Army Garrison - Alaska Comments on the Preliminary Draft EA

Subject	Issue	Air Force Response
NEPA Issues	Alternatives to the Proposed Action (i.e., use of land on north side of Elmendorf AFB)	The Air Force has rigorously explored a range of alternatives as described in Chapter 2. Use of land on the north side of Elmendorf AFB is constrained due to noise levels, proximity to antenna fields, topographical considerations and runway approach zones.
	Cumulative impacts	The Air Force has evaluated the projects that are known to date, and has found that cumulative impacts would not be anticipated for environmental resources.
	Mitigation	The EA includes best management practices to avoid impacts; these management practices are part of the project design and planning. No mitigation measures are required.
	Consultation with the U.S. Bureau of Land Management	The Air Force has consulted, and will continue to consult, with the BLM on issues concerning vegetative jurisdiction on military lands.
Project Design	Access road	The Air Force will prepare a separate NEPA evaluation for the proposed access road and bridge over Ship Creek.
	Sewer line connection	The Air Force would not connect to the existing Army sewer line on Fort Richardson (a new sewer line would be constructed from housing on the Fort Richardson parcel to Elmendorf AFB).
	Presence of tanks at pump house	The EA has been revised to indicate that a 300-gallon aboveground diesel fuel storage tank is at the pump house (Bldg 35-630).
	Ammunition storage area	Text in the EA has been revised to indicate that an ammunition storage area is located less than one mile northwest of the proposed housing site.
	Transfer of standby water wells	The Army will retain, through easement, the portion of the property where pump houses are located and where prior petroleum products have been released.
	Fencing of the housing area	The housing area would be fenced at the property line.
	Bridge construction	The Air Force will prepare a separate NEPA evaluation for the proposed access road and bridge over Ship Creek.
Biological Resources	Floodplains	The proposed site for housing on Fort Richardson is not located within a floodplain.
	Need for jurisdictional wetlands determination	The Air Force understands that a new wetland delineation by the Corps of Engineers is being undertaken, and that this data will supercede the 1995 information. Preliminary results of this study indicate that no wetlands are located on the subject property.
	Moose habitat/compensation of habitat loss	The Air Force will prepare a Moose Habitat Compensation Plan in consultation with the Army and regulatory agencies. The EA does not discuss financial aspects of mitigation.
Air Quality	Emissions from new housing units	The net increase in housing units on Elmendorf AFB would be 208 units. Additional emission sources associated with heating of these units will be incorporated into the planning inventory for air pollutant emissions from Elmendorf AFB in accordance with air quality permitting requirements. Text in Subchapter 4.4.1 of the EA has been added.
	Mitigation for construction emissions	The Air Force has determined that mitigation is not required for construction emissions. Watering for dust control will be implemented as a standard construction practice, not a specific mitigation measure.

Table 24. Air Force Responses to U.S. Army Garrison - Alaska Comments on the Preliminary Draft EA (Cont'd)

Subject	Issue	Air Force Response
Air Quality (Cont'd)	Permit requirements	Elmendorf AFB would be responsible for obtaining permits.
	Climate	Text in the EA has been revised to describe the climate of the Fort Richardson area.
Water Resources	Water quality of Ship Creek	No additional information on the water quality of Ship Creek is available.
	Water supply	The increase in domestic water consumption is expected to be offset by the decommissioning of the steam plant.
	Abandoned channel of Ship Creek	The former channel of Ship Creek was fully blocked by the Glenn Highway. No wetlands delineation by the Corps of Engineers was conducted, and this channel does not appear on the 100-year flood maps.
	Groundwater wellhead protection	The Air Force would outgrant a defined area around drinking water wells via easement to the Army. Security around these wellhead protection areas will be the responsibility of the Army. The Proposed Action would include installation of a new sewer line however, this line would not be constructed within the defined protection area for the well.
Public Services	School enrollment	The Air Force has met with the Anchorage School District. Impacts to local schools would not be anticipated because the school district is in the process of reorganizing to ensure that changes in enrollment can be accommodated within the system.
Utilities	Capacity of utility services	The Air Force has coordinated with the Army regarding utility capacities.
Noise	Placement of housing under runway patterns	As shown on Figure 8 (Baseline AICUZ Noise Levels) and Figure 10 (Projected Noise Level Contours), the subject property on Fort Richardson would be located outside the 65 dBA noise level contour. The property is not expected to be exposed to runway air traffic noise that exceeds 65 dBA. The property is south of the traffic pattern associated with these runways.
Land Use	Recreational use of land for north of Bartlett High School	The Air Force would install a fence at the property line of the site. This would result in loss of approximately 1 kilometer of the ski trail unofficially used by Bartlett High School. The area to be cleared will include a 150 foot buffer zone, which will enable reconnection of the trail south of the fence line.
	Use of wheeled/tracked vehicles on Army land	The EA has been revised to indicate that wheeled/tracked vehicles are not allowed.
	Aesthetic impacts	The proposed Phase II PSF housing that would be constructed on Fort Richardson would be designed to be compatible with the architectural character of the area consistent with applicable Air Force standards and guidance. Placement of housing on property to be acquired from Fort Richardson would not result in loss of scenic views. For these reasons, impacts to visual resources would not be anticipated and are not evaluated in this EA.
	Impact on neighboring Alaska Native Heritage Center	The Air Force has met with the Alaska Native Heritage Center and there are no issues of concern at this time.

Table 24. Air Force Responses to U.S. Army Garrison - Alaska Comments on the Preliminary Draft EA (Cont'd)

Subject	Issue	Air Force Response
Hazardous Waste/Hazardous Materials	Site contamination on Fort Richardson parcel	The Air Force has reviewed the Army's Environmental Condition of Property (ECOP) and incorporated these findings into the EA.
	Lead-based paint management	Text in the EA has been revised to cite the Fort Richardson Lead Based Paint Management Plan.
Traffic	Traffic Management Plan	The Air Force would prepare a Traffic Management Plan, if determined to be required by the government agencies.
	Traffic from new access road	Traffic from the proposed access road would be evaluated in a separate NEPA evaluation.

This Environmental Assessment has addressed the specific issues and concerns raised during the public review process for the Proposed Action.

CHAPTER 7
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