

**PHASE V, REPLACE MILITARY FAMILY HOUSING  
PROJECT NZAS 86-00018  
FINDING OF NO SIGNIFICANT IMPACT**

This Finding Of No Significant Impact (FONSI) is an analysis of the environmental impacts associated with the construction of 35 new military family housing (MFH) units and the demolition or removal of 35 old MFH units. The fourth phase of this housing project was analyzed in the environmental assessment, "Phase IV, Construction Of New Housing At Malmstrom AFB". A FONSI for that assessment was signed on 21 July 1998. This project is a continuation of that action.

**Proposed Action:**

The proposed action is the replacement of 35 housing units and associated garages and infrastructure on Malmstrom AFB. These units are over 40 years old, undersized, and do not meet the "whole house/neighborhood" criteria. The attached DD Form 1391 details the deficiencies found in these units. The new housing will be constructed in Vista Village, the same location as in Phase IV. The housing to be demolished or sold and moved consist of units in the relocateable housing area.

**Alternative 1, Renovate Existing Housing:**

Alternative 1 would require the renovation and upgrade of 35 housing units to meet existing building codes and housing criteria as specified in Part II of Military Handbook 1190, "Facilities Planning and Design Guide". This alternative would require plumbing and electrical replacement and upgrade, addition of livable square footage, and the enlargement of closet space. Exterior improvements would include additions of patios and privacy fences and additions of and improvements to existing common areas.

**No Action Alternative:**

The no action alternative requires Malmstrom to maintain the status quo. This would require the installation to use the existing housing as is. There would not be any improvements to these units other than standard maintenance as required and as specified in the housing maintenance contract.

**Affected Environment:**

Chapter 3 of the Final Environmental Assessment: "Phase IV, Construction Of New Housing At Malmstrom AFB". provides a accurate description of the affected environment. This information is incorporated by reference (per 40 CFR 1502.21) into this FONSI.

**Environmental Consequences:**

The focus of this assessment was on the environmental and socioeconomical impacts to humans and the natural environment. The scope of the proposed action is limited to a small area within the confines of Malmstrom AFB. Activities related to this action take place within the developed portion of the base causing little or no change to the existing environment.

# Report Documentation Page

Form Approved  
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>21 DEC 1998</b>		2. REPORT TYPE <b>EA</b>		3. DATES COVERED <b>17-05-1998 to 17-05-2004</b>	
4. TITLE AND SUBTITLE <b>EA for Malmstrom Phase V housing</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) <b>Jeanette DeBlois; Philip Hoffman</b>				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>341 Civil Engineer Squadron,39 78th st N,Malmstrom AFB,MT,59402</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT <b>This EA has been developed for the Replace Family Housing Phase V (Jupiter) design and construction project at Malmstrom AFB. The current family housing situation at Malmstrom AFB is very poor. Of the 1406 lousing units on base, only 377 are deemed adequate according to current AF Housing Guidance(USAF 1995a, 2003). Many of the existing homes have deterioriated and the following problems have been reported: electrical wiring and fixtures that do not meet current building codes, plumbing fixtures that have corroded, outdated flooring, asbestos is present in flooring and countertops, and lead-based paint has been detected on several interior and exterior surfaces. The AF proposes to build new housing units within the existing housing area to remedy these needs.</b>					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>67</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

#### Air:

Malmstrom AFB is in an attainment area; therefore, a conformity determination is not required. Potential effects created due to this project include road dust entrainment from construction vehicles, dust from temporary storage piles and increased vehicular emissions from construction vehicles and labor force transportation. All of these effects would be insignificant and last for only the duration of the construction. There will be no net gain in the number of housing units so there should be no increases in air emissions due to an increase in occupants in base housing.

#### Water:

The proposed action will not effect groundwater. The maximum depth of any excavation would be approximately 10 feet. At this depth, no impacts to aquifers or sources of groundwater are anticipated. The size of the construction area would be approximately 15 acres; therefore, a general storm water permit for construction sites and an erosion control plan would be required.

There is no surface water near the preferred site. The potential for accidental discharges that could occur during construction that would have an impact on water quality is negligible. The alteration of the surface water hydrology during construction and use could impact surface water quality from discharges of sediment, but the likelihood of this occurring is minimal. The area has less than a 2% grade in any direction and the existence of good vegetative cover surrounding the area makes the migration of contaminants unlikely.

#### Geological Resources:

The proposed site has no unique geological features. With the lack of unique topographic features on the base and the absence of active seismic faults in the vicinity, the potential for impacts is insignificant. Due to the depth at which bedrock is encountered, it would not be impacted by proposed action. Terrain at the preferred site is flat and any water-borne soil erosion from construction and use of the site should remain in the immediate area.

#### Biologic Resources:

The proposed site is currently a trailer court consisting of mobile homes paved roads and small yards planted with turf grasses. The use of this property would not change; therefore, the proposed action would have no impact on biological resources. No impacts to wetland areas, significant habitat areas, or threatened or endangered species are expected from the proposed action.

#### Cultural Resources:

No cultural resources have been identified within the confines of the proposed site. Since, 1987 four cultural resources have been performed on the installation and when combined cover the entire installation. The proposed site is currently a trailer court. Prior to that, the site was open grassland. No historic or prehistoric sites were found near the proposed site.

#### Noise Resources:

The proposed site is located approximately 250 feet from the nearest sensitive noise receptor, Lincoln Drive housing. Noise generated during construction from heavy equipment will present a short-term nuisance to some housing occupants. However, because of the short-term nature of the construction impacts should be insignificant. In addition, controlling the times that equipment operation and construction activities can occur will mitigate any noise impacts generated from the proposed action.

#### Waste Management:

Solid waste would be generated during the construction and demolition process. This waste generation is inherent for this type of project and impacts to Malmstrom's current waste stream would be minimal. The amount of waste could significantly be reduced if the relocatable housing was sold and moved off Malmstrom AFB.

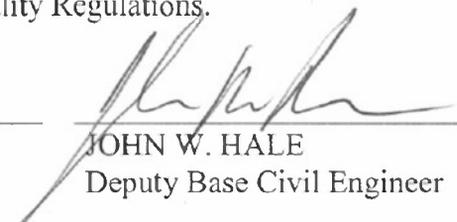
A spill would be handled according to Malmstrom's spill prevention and response plan. The limited quantities of hazardous materials and the adherence to a spill plan would minimize the potential for significant impacts.

#### Socioeconomic Impacts:

The proposed action would provide an estimated \$7,700,000 to the local economy. This equates to approximately 3 percent of Malmstrom's total annual contribution to the local economy and will have a beneficial impact on socioeconomics.

After completing this environmental assessment, I have determined that the proposed action would not have significant impact on the quality of human or natural environment. This analysis fulfills the requirements of the National Environmental Policy Act and Council of Environmental Quality Regulations.

Date: 21 DEC 98

  
\_\_\_\_\_  
JOHN W. HALE  
Deputy Base Civil Engineer

file 33b

ENVIRONMENTAL ASSESSMENT FOR  
FISCAL YEAR 2005  
REPLACE FAMILY HOUSING (JUPITER) PHASE V AT  
MALMSTROM AIR FORCE BASE, MONTANA



*Prepared for:*



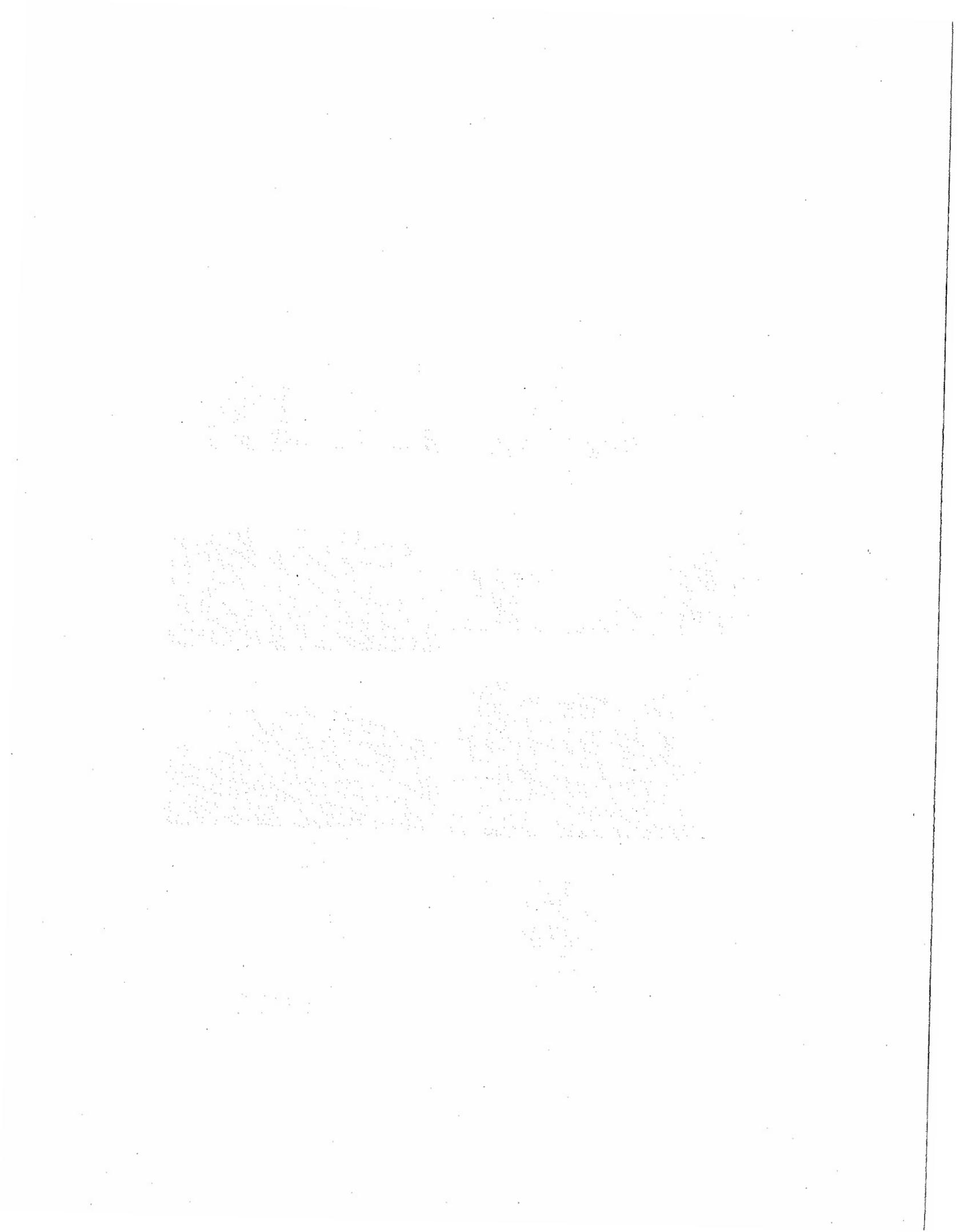
341<sup>st</sup> CES/CEV  
39 78<sup>th</sup> Street N.  
Malmstrom AFB, MT 59402-7536

*Prepared by:*



US Army Corps  
of Engineers ®  
Seattle District

May 17, 2004



**DOCUMENT PAGE**

**Document Title** Environmental Assessment for Fiscal Year 2005  
Replace Family Housing (Jupiter) Phase V at  
Malmstrom Air Force Base; Great Falls, Montana

**Date Submitted:** 17 May, 2004

**Date Finalized:** 15 September, 2004

**USACE Project Manager:** Jim Nakamoto  
(206) 764-6707

**USACE Preparers:** Jeanette DeBlois, Philip Hoffman

**Reviewed by:** Kathleen Kunz, CENWS-PM-PL-ER

**USACE Seattle District  
Environmental Coordinator** Philip Hoffman  
(206) 764-6577  
[philip.l.hoffman@usace.army.mil](mailto:philip.l.hoffman@usace.army.mil)

**Malmstrom AFB 341<sup>st</sup> CES/CEV  
Environmental Contact** Don Geertz  
(406) 731-7227  
[Donald.geertz@malmstrom.af.mil](mailto:Donald.geertz@malmstrom.af.mil)

This page left intentionally blank for duplicating purposes.

## TABLE OF CONTENTS

<b>1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION .....</b>	<b>1</b>
1.1 INTRODUCTION .....	1
1.2 BACKGROUND .....	3
1.3 PURPOSE OF AND NEED FOR PROPOSED ACTION .....	5
1.4 SCOPE OF THE ENVIRONMENTAL REVIEW .....	8
1.5 OTHER APPLICABLE REGULATORY REQUIREMENTS .....	8
1.5.1 <i>Air Quality</i> .....	8
1.5.2 <i>Water Quality</i> .....	9
1.5.3 <i>Public Health and Safety/Hazardous Waste</i> .....	9
1.5.4 <i>Biological Resources</i> .....	9
1.5.5 <i>Cultural, Paleontological, and Archaeological Resources</i> .....	10
<b>2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES .....</b>	<b>11</b>
2.1 PROPOSED ACTION .....	11
2.1.1 <i>Demolition</i> .....	11
2.1.2 <i>CDW Hauling and Disposal/Recycle</i> .....	11
2.1.3 <i>Soil Borrow and Backfill</i> .....	11
2.1.4 <i>New Home Construction</i> .....	12
2.2 NO ACTION ALTERNATIVE .....	13
2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD .....	13
2.4 COMPARISON OF ALTERNATIVES .....	13
<b>3.0 AFFECTED ENVIRONMENT .....</b>	<b>15</b>
3.1 AIR RESOURCES .....	15
3.1.1 <i>Climatology and Meteorology</i> .....	17
3.1.2 <i>Air Quality</i> .....	19
3.2 WATER RESOURCES .....	20
3.2.1 <i>Groundwater</i> .....	20
3.2.2 <i>Surface Water</i> .....	20
3.3 GEOLOGICAL RESOURCES .....	22
3.4 BIOLOGICAL RESOURCES .....	23
3.4.1 <i>Vegetation, Wetlands, and Floodplains</i> .....	23
3.4.2 <i>Wildlife</i> .....	24
3.5 CULTURAL RESOURCES .....	24
3.5.1 <i>Historical Setting</i> .....	25
3.5.2 <i>Identified Cultural Resources</i> .....	26
3.6 NOISE .....	27
3.6.1 <i>Existing Noise Setting</i> .....	28
3.7 HEALTH, SAFETY, AND WASTE MANAGEMENT .....	29
3.7.1 <i>Public Health Management</i> .....	29
3.7.2 <i>Worker Safety and Health</i> .....	29
3.7.3 <i>Solid and Hazardous Waste Management</i> .....	29
3.7.4 <i>Sewage and Storm Water Waste Management</i> .....	30
3.7.5 <i>Environmental Remediation Activities</i> .....	30

3.7.6	<i>Pesticides</i> .....	30
3.7.7	<i>Harmful Substances</i> .....	30
3.8	LAND USE .....	30
3.8.1	<i>Land Use</i> .....	31
3.8.2	<i>Transportation</i> .....	31
3.8.3	<i>Visual Resources</i> .....	31
3.9	SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE.....	32
3.9.1	<i>Definition of the Resource</i> .....	32
3.9.2	<i>Population and Employment</i> .....	32
3.9.3	<i>Environmental Justice and Protection of Children</i> .....	33
<b>4.0</b>	<b>ENVIRONMENTAL CONSEQUENCES</b> .....	<b>35</b>
4.1	AIR RESOURCES .....	35
4.1.1	<i>Potential Impact from Proposed Action</i> .....	35
4.1.2	<i>Potential Impact from the No Action Alternative</i> .....	36
4.2	WATER RESOURCES .....	36
4.2.1	<i>Potential Impact from Proposed Action</i> .....	36
4.2.2	<i>Potential Impact from No Action Alternative</i> .....	37
4.3	GEOLOGICAL RESOURCES .....	37
4.3.1	<i>Potential Impacts from Proposed Action</i> .....	37
4.3.2	<i>Potential Impact from No Action Alternative</i> .....	37
4.4	BIOLOGICAL RESOURCES.....	38
4.4.1	<i>Potential Impacts from Proposed Action</i> .....	38
4.4.2	<i>Potential Impact from No Action Alternative</i> .....	38
4.5	CULTURAL RESOURCES .....	39
4.5.1	<i>Potential Impact from Proposed Action</i> .....	39
4.5.2	<i>Potential Impact from No Action Alternative</i> .....	40
4.6	NOISE RESOURCES.....	40
4.6.1	<i>Potential Impact from Proposed Action</i> .....	40
4.6.2	<i>Potential Impact from No Action Alternative</i> .....	41
4.7	HEALTH, SAFETY, AND WASTE MANAGEMENT .....	41
4.7.1	<i>Potential Impact from Proposed Action</i> .....	41
4.7.2	<i>Potential Impact from No Action Alternative</i> .....	42
4.8	LAND USE .....	42
4.8.1	<i>Potential Impact from Proposed Action</i> .....	42
4.8.2	<i>Potential Impact from No Action Alternative</i> .....	42
4.9	SOCIOECONOMIC AND ENVIRONMENTAL JUSTICE IMPACTS.....	43
4.9.1	<i>Potential Impact from Proposed Action</i> .....	43
4.9.2	<i>Potential Impact From No Action Alternative</i> .....	43
<b>5.0</b>	<b>CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES</b> .....	<b>45</b>
5.1	CUMULATIVE EFFECTS .....	45
5.1.1	<i>Definition of Cumulative Effects</i> .....	45
5.1.2	<i>Past, Present, and Reasonably Foreseeable Actions</i> .....	46
5.1.3	<i>Analysis of Cumulative Impacts</i> .....	46
5.2	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES .....	47

**6.0 REFERENCES ..... 49**

**LIST OF TABLES**

Table 1: Malmstrom AFB On-Base Housing Inventory..... 7  
Table 2: Maximum Net Floor Area Authorized by Air Force Guidance..... 8  
Table 3: FY 2004 Replacement Housing Project Schedule..... 11  
Table 4: Summary of Potential Environmental Impacts of Proposed Action and No Action  
Alternatives..... 13  
Table 5: Montana and Federal Ambient Air Quality Standards ..... 16  
Table 6: Climate Data for Great Falls, MT..... 18  
Table 7: Typical Day-Night Noise Levels in Urban Areas in the United States ..... 28  
Table 8: Noise Levels for Construction Phases ..... 40

**LIST OF FIGURES**

Figure 1: Vicinity Map of Malmstrom AFB..... 4  
Figure 2: Location Map for Features of the Proposed Action ..... 4  
Figure 3: Malmstrom AFB Family Housing Renovation Schedule ..... 6  
Figure 4: Surface Water Drainage Patterns at Malmstrom AFB ..... 21

**APPENDIX**

Notices Placed and Comments Received on Draft EA.....53

This page left intentionally blank for duplicating purposes.

**ENVIRONMENTAL ASSESSMENT**  
**REPLACE FAMILY HOUSING FISCAL YEAR 2005**  
**MALMSTROM AIR FORCE BASE; GREAT FALLS, MONTANA**

**1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION**

**1.1 Executive Summary/Abstract**

This Environmental Assessment has been developed for the Replace Family Housing Phase V (Jupiter) design and construction project at Malmstrom AFB. The current family housing situation at Malmstrom AFB is very poor. Of the 1,406 housing units on base, only 377 are deemed adequate according to current Air Force Housing Guidance (USAF 1995a, 2003). Many of the existing homes have deteriorated and the following problems have been reported: electrical wiring and fixtures that do not meet current building codes, plumbing fixtures that have corroded, outdated flooring, asbestos is present in flooring and countertops, and lead-based paint has been detected on several interior and exterior surfaces. The Air Force proposes to build new housing units within the existing housing area to remedy these needs.

The Proposed Action will consist of two construction sites that are described using Project directions: note that Project North is about 45 degrees west of True North. The west construction site is within the area bounded by Perimeter Road and Walnut Street. The east construction site is within the area bounded by 76<sup>th</sup> Street North, Perimeter Road, 74<sup>th</sup> Street North, and Acom Street. The Proposed Action includes the construction of 130 homes, consisting of 65 duplex units. There will be 100 three-bedroom and 30 four-bedroom units in this project, with the option to add an additional 20 units currently programmed for Phase 6. Prior to commencing construction, the existing site will be filled with approximately 15,000 cubic yards of material from a permitted source and re-graded because poor drainage has been documented on site. Due to the prior removal of substandard housing from this site, project alternatives consisted of different densities and types of new construction.

This Environmental Assessment discusses in detail the potential effects the Proposed Action will have on the following resources: air, water, geological, biological, cultural, noise, health, land, and socioeconomic. The Proposed Action would occur in Cascade County, Montana, where the air quality is designated as in attainment and better than the national standards for several air pollutants. The Proposed Action could potentially have an impact on the nearest PSD Class I area, which is within 50 miles of the site, depending on the emission levels. Due to the nature of construction activities and the short duration of the Proposed Action, the impact to air resources is likely to be short-term and not significant.

Groundwater resources consist of deep, confined aquifers that range from 100 feet to 200 feet below land surface on base. Surface water drains in ephemeral streams and coulees to the Missouri River, which is located about one mile north of the base. The Proposed Action would not be expected to significantly impact groundwater resources. Short-term impacts to surface

water could potentially occur during construction, but long-term impacts to surface water resources would not occur.

The Proposed Action would occur within Seismic Zone 1 but it is recommended that the buildings be designed for Seismic Zone 2B because Great Falls is situated near the seismic zone boundary. The modern soils of Malmstrom AFB have developed directly on Quaternary glacial deposits and consist of: sandy lean clay, clayey sand, silty sand, fat clay, and high-plasticity, lean clay. Although the Proposed Action includes developing the existing site, it was previously used for housing, thus no significant long-term impacts to site soils are expected.

There are no federally listed threatened or endangered species that occur on Malmstrom AFB, and no delineated wetlands currently exist within the site. Consistent with the lack of impact to the site soils, the Proposed Action would have an insignificant impact on biological resources, wetland areas, habitat areas, or threatened or endangered species.

Cultural resources of concern located near the proposed area of impact include a railroad segment that may be eligible for the National Register of Historic Places. The site proposed to be developed in this action was previously used for housing, thus impacts to traditional resources are not expected under the Proposed Action.

Existing noise levels are documented as falling within the "Urban Residential" noise level, consisting of a typical range of 58 to 62 dB. The Proposed Action would increase existing noise levels as construction commences and continues, but this noise will be intermittent and occur at times when most residents are not in the area surrounding the construction site.

Land use at Malmstrom AFB consists of primarily the airfield and housing units. Private vehicles dominate traffic at Malmstrom, and no public transit is available. The presence of construction vehicles will increase traffic levels in the north-west section of Malmstrom AFB, but increases in traffic volumes associated with construction activity would be temporary and are not unlike volumes experienced during earlier housing development phases. No long-term impacts to on-base transportation systems would result from the Proposed Action.

The operation of Malmstrom AFB makes an important contribution to the economy of the region through both direct employment and purchases from local businesses. The presence of the base provides economic stability to the city and the region. No long-term changes in base employment or expenditures are anticipated as a result of the Proposed Action. No permanent or long-lasting socioeconomic impacts are anticipated as a result of implementation of the Proposed Action.

Construction impacts on air quality will be short-term and limited to localized areas. Permanent changes to soil structure and stability can occur by disrupting and reworking certain soils. Noise from construction activities is an unavoidable short-term impact. As multiple phases of housing construction occur, on-base roads will begin to deteriorate due to construction traffic. In light of Past, present, and reasonably foreseeable future actions, USAF expects no significant cumulative impacts as a result of this project.

## **1.2 Introduction**

The United States Air Force (USAF), as the 341<sup>st</sup> Civil Engineering Squadron (341 CES/CEV), proposes to develop 130 family housing units in the Jupiter housing area at Malmstrom AFB.

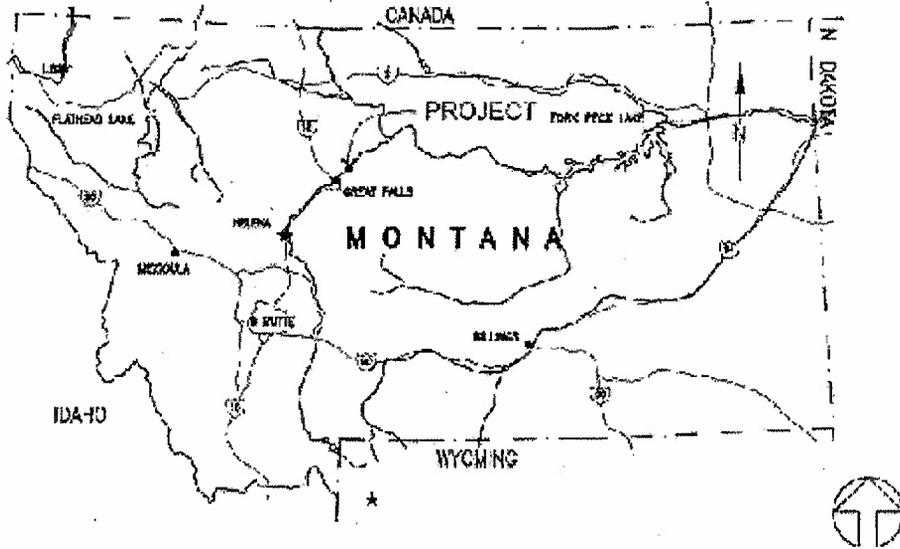
This environmental Assessment (EA) has been prepared to analyze the potential environmental consequences associated with the Proposed Action and No Action Alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA) and the implementing regulations.

Section 1.3 provides background information on Malmstrom Air Force Base (AFB). The Purpose of and Need for the Proposed Action are discussed in Section 1.4. A detailed description of the Proposed Action and the No Action Alternative is provided in Chapter 2. Chapter 3 describes the existing conditions of various environmental resources that could be affected by the Proposed Action or the No Action Alternative. Chapter 4 describes how those resources would be affected by implementation of the Proposed Action or the No Action Alternative. Chapter 5 evaluates the cumulative effects of the Proposed Action. Chapter 6 is a bibliography of resources cited in the preparation of this EA.

## **1.3 Background**

Malmstrom AFB encompasses over 3,600 acres of land in Cascade County in west central Montana (Figure 1). The base lies approximately 0.3 miles east of the City of Great Falls city limit at its closest point and is 5 miles from the central business district of the City. Interstate Highway 15 passes along the western boundary of Great Falls. Access to the base main gate is off US Highway 87/89, east of Interstate Highway 15, via 2<sup>nd</sup> Avenue North.

The construction site has been divided into west and east sites in accordance with Project North at Malmstrom AFB. Project North is approximately equivalent to True North-East. As shown on Figure 2, the west construction site is bound by Perimeter Road on the east and Walnut Street on the north and west. The east construction site is bound by 76<sup>th</sup> Street North on the north, Perimeter Road on the west, 74<sup>th</sup> Street North on the south, and Acorn Street on the east.



LOCATION MAP

Figure 1: Vicinity Map of Malmstrom AFB

Housing area, enlarged in Figure 3.

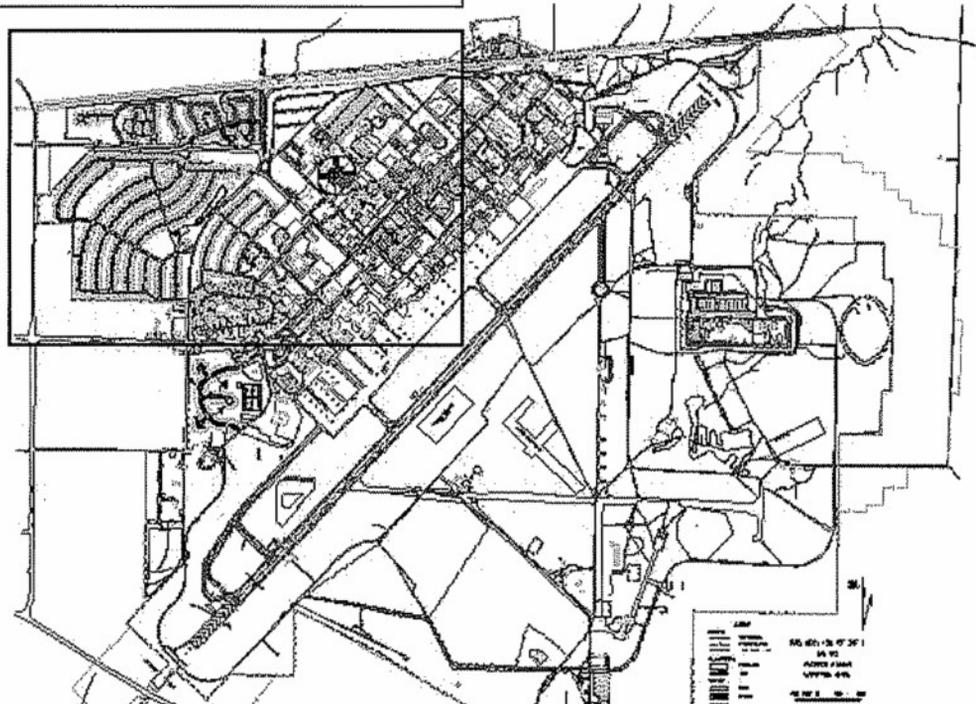


Figure 2: Map of Malmstrom Air Force Base, Great Falls Montana.

The purpose of the Air Force Housing Community Plan and the whole house/whole neighborhood focus is to increase the overall quality of the entire family housing area. It provides a comprehensive plan for improving the overall quality of the family housing environment by integrating elements such as utility and infrastructure planning, site planning, open/recreation space development, and "streetscape" development (USAF 1995a). The goal of neighborhood design for Air Force family housing is to develop and sustain a residential environment that responds to the Air Force family and reinforces the connection between the families and the community. Malmstrom AFB provides on-base family housing for military personnel and their families. Over 600 housing structures, comprised of multi-family apartments, duplexes, and single-family homes, house over 1,400 family units.

#### **1.4 Project Need and Purpose**

In spite of routine maintenance, many of the homes have deteriorated to a point where replacement is the most economical alternative. Air Force guidance states that if the cost of renovation exceeds 70% of the replacement cost, then the housing unit should be replaced (USAF 1995a). Recent inspections of the on-base housing reveal that:

- Most electrical wiring and fixtures do not meet current building codes, wiring is brittle and exposed in many units and is a fire hazard, there are no Ground Fault Interrupter circuit protections, and outlets lack proper grounding protection.
- Plumbing systems have succumbed to the effects of hard water and corrosion, resulting in severe constriction and pipe leakage, and plumbing fixtures are worn and discolored and require replacing.
- Bedrooms are small and lack closet space.
- Bathrooms are small and fixtures are outdated and energy-inefficient.
- Kitchens lack sufficient storage and counter space, cabinets are old and unsightly, and countertops and sinks are badly worn.
- Flooring throughout the homes is outdated.
- Asbestos has been detected in flooring, counter tops, roofing material, and insulation.
- Lead-based paint has been detected on both interior and exterior surfaces

The purpose of this action is to replace previously removed substandard housing with adequate housing. The bulk of the currently available family housing at Malmstrom AFB include structures that are typically 30 to 40 years old and no longer meet the Air Force's standards for military housing. Of the 1,406 housing units on base, only 377 are deemed adequate according to current Air Force Housing Guidance (USAF 1995a, 2003). This Proposed Action is one phase of multiple phases planned to upgrade all of the on-base family housing at Malmstrom AFB. Figure 3 and Table 1 show the current housing inventory and actual or planned dates for renovation or replacement.

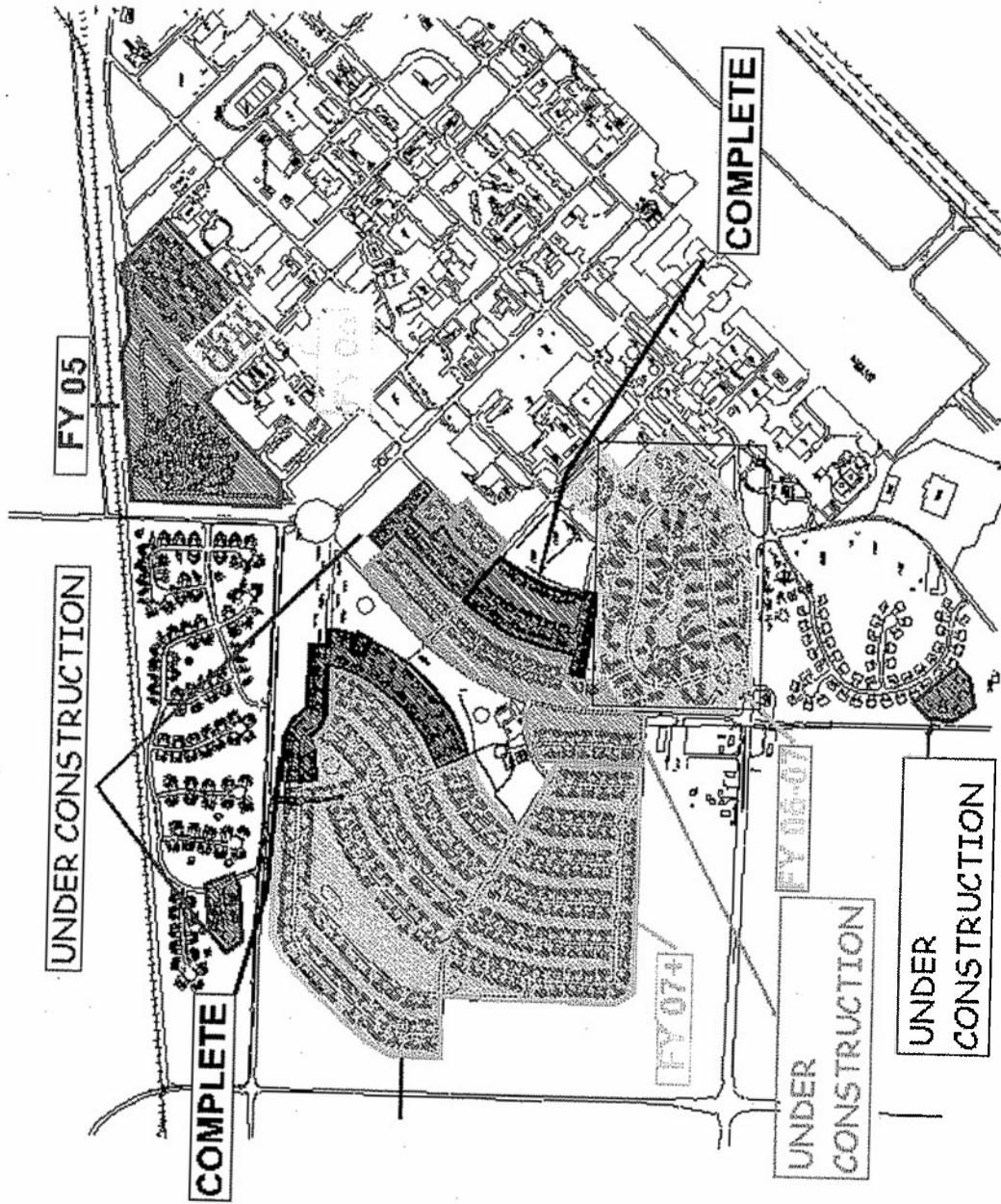


Figure 3: Malmstrom AFB Family Housing Renovation Schedule by Location on Base.

**Table 1: Malmstrom AFB On-Base Housing Inventory**

Neighborhood	Renovated	Bedrooms	Net Sq.Ft.	No. of Units	Construction Schedule
Atlas Village	No	2	808	219	FYs 2006-07
	No	3	1,069	74	
	No	3	1,148	9	
	No	3	1,200	4	
<b>Jupiter</b>	<b>No</b>	<b>3</b>	<b>1,104</b>	<b>90</b>	<b>FY 2005</b>
Matador Manor	No	3	1,522	6	Scheduled for FY 2003
	Yes	3	1,522	39	New construction in FY 2003
	Yes	3	1,534	35	
	Yes	3	1,574	6	
	Yes	4	1,722	8	
Minuteman Village	No	3	1,522	2	Scheduled for FY 2003
	No	3	1,534	2	New Construction in FY 2003
	Yes	2	1,282	10	
	Yes	3	1,534	2	
	Yes	3	1,670	143	
	Yes	3	1,707	4	
	Yes	3	1,800	2	
	Yes	3	1,954	13	
Yes	4	1,801	24		
Peacekeeper Park	Yes	3	1,775	10	Previously Completed
	Yes	3	1,813	16	
	Yes	4	1,407	1	
	Yes	4	2,072	22	
	Yes	4	2,116	9	
	No	3	1,080	157	Ten to be replaced in FY 2004, others in FY 2007 and beyond
	No	3	1,116	140	Ten to be replaced in FY 2004, others in FY 2007 and beyond
	No	3	1,259	73	FY 2007+
	No	3	1,346	20	FY 2007+
	No	4	1,247	96	Four to be replaced in FY 2004, others in FY 2007 and beyond
Titan Village	No	4	1,407	16	FY 2007+
	Yes	2	1,353	48	Previously Completed
	Yes	4	1,838	4	
	No	2	1,311	6	To be replaced in FY 2004
	No	2	1,353	28	To be replaced in FY 2004
	No	3	1,380	22	2 Scheduled for 2003, 20 to be replaced in FY 2004
	No	3	1,788	14	Scheduled for FY 2003
	No	3	1,811	8	To be replaced in FY 2004
	No	4	1,714	8	To be replaced in FY 2004
	No	4	2,051	2	Scheduled for FY 2003
No	4	2,113	6	Scheduled for FY 2003	
No	4	2,648	2	To be replaced in FY 2004	
Washington Circle	No	3	1,553	4	FYs 2006-07

**Bold/shading indicates housing included in the current Proposed Action**

Table 2 lists the maximum gross floor area authorized by paygrade according to the Air Force Family Housing Guide (USAF April 2004 DRAFT). Much of the available family housing at Malmstrom AFB is substantially smaller than these guidelines.

**Table 2: Maximum Gross Floor Area Authorized by Air Force Guidance**

If the occupant's paygrade is	Then the number of bedrooms is	And the maximum gross square footage is
0-7 and above	4	3,660 SF
0-6	4	2,770 SF
E-9	4	2,540 SF
0-4 and 0-5	4	2,310 SF
	3	2,020 SF
0-1 through 0-3 and E-7 through E-8	5	2,510 SF
	4	2,150 SF
	3	1,860 SF
	2/Den	1,670 SF
	2	1,490 SF
E-1 through E-6	5	2,300 SF
	4	1,950 SF
	3	1,630 SF
	2/Den	1,480 SF
	2	1,340 SF

This document addresses the impacts related to the construction of approximately 130 homes, consisting of 65 duplex units, with construction planned in Fiscal Year (FY) 2005. This construction is to replace housing units that were previously removed and provided to the Walking Shield Program for Tribal use. Thus, there are currently no housing units within the Jupiter area.

### 1.5 Scope of the Environmental Review

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations (§40 CFR 1500-1508), and Air Force Instruction (AFI) 32-7061, which has been superseded by 32 CFR 989. As allowed by §40 CFR 1500.4 and 1502.20 and 32 CFR 989, this EA focuses on specific issues and concerns affecting Malmstrom AFB.

### 1.6 Other Applicable Regulatory Requirements

Each environmental resource is regulated and/or protected by Federal and State of Montana regulations. In establishing the background conditions and assessing the potential environmental consequences of the Proposed Action, the following regulations were also considered.

#### 1.6.1 Air Quality

The Montana Clean Air Act (Montana Code Annotated [MCA], Title 75, Chapter 2) implements the federal Clean Air Act. The Montana Clean Air Act, implemented by the Air Quality Procedural Regulations, the Air Quality Regulations, and the Ambient Air Quality Standards, establishes ambient air quality standards and permitting and monitoring procedures.

The Clean Air Amendment Act (CAAA) of 1990 established new federal nonattainment classifications, new emission control requirements, and new compliance dates for nonattainment areas. The requirements and compliance dates are based on the severity of nonattainment classification.

### ***1.6.2 Water Quality***

The Water Pollution Control Law (MCA 75.05) sets forth water conservation, water quality protection, and pollution prevention and abatement measures. Implementing regulations include the Water Pollution Control Regulations (Administrative Rule of Montana [ARM], Title 16, Chapter 20, Subchapter 7).

The Montana Pollutant Discharge Elimination System (MPDES) Rules (ARM 16.20.09) establish effluent limitations, treatment standards, and other requirements for point source discharge of waste into State waters, including storm water runoff.

The Groundwater Pollution Control Regulations (ARM 16.20) establish groundwater classification, and set forth protection and permitting requirements, while the Surface Water Quality Standards (ARM 16.20.06) establish surface water quality criteria to ensure public health and safety and provide for water conservation.

### ***1.6.3 Public Health and Safety/Hazardous Waste***

The Solid Waste and Litter Control Act (MCA 75.10) provides for coordinated State solid waste management and a resource recovery plan. The Integrated Waste Management Act (MCA 75.10) provides for waste reduction and recycling programs.

The Hazardous Waste Act (MCA 75.10), and the Hazardous Waste Management Regulations (ARM 16.44) control the generation, storage, transportation, treatment, and disposal of hazardous wastes; the Act also authorizes the State to implement a program pursuant to the Federal Resource Conservation and Recovery Act (RCRA).

The Refuse Disposal Regulations (ARM 16.14.05) implement the hazardous waste act and regulations. These regulations provide uniform standards for the storage, treatment, recycling, recovery, and disposal of solid waste, including hazardous waste, and the transportation of hazardous waste.

### ***1.6.4 Biological Resources***

The Endangered Species Act (§16 USC 1531-1543) requires Federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of endangered or threatened species or destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on endangered or threatened species of fish, wildlife,

and plants and their critical habitats and take steps to conserve and protect these species. The Act requires the avoidance or mitigation of all potentially adverse impacts to endangered and threatened species.

EO 11990, Protection of Wetlands, requires Federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All Federal and federally supported activities and projects must comply with EO 11990. In addition, activities occurring in jurisdictional wetlands, and other Waters of the U.S. require compliance with Section 404 of the Clean Water Act administered by the U.S. Army Corps of Engineers and Section 401 of Clean Water Act administered by the Environmental Protection Agency (EPA) for on-Base lands and the Montana Department of Environmental Quality for off-Base lands.

#### ***1.6.5 Cultural, Paleontological, and Archaeological Resources***

The primary goal of the National Historic Preservation Act (NHPA) of 1966 (§16 USC 470 et seq., as amended); is to ensure adequate consideration of the values of historic properties in carrying out Federal activities and to attempt to identify and mitigate impacts to significant historic properties. The NHPA is the principal authority used to protect historic properties. Federal agencies must determine the effect of their actions on cultural resources and take certain steps to ensure they locate, identify, evaluate, and protect all resources. 36 CFR 800 defines the responsibilities of the State, the Federal Government, and the Advisory Council on Historic Preservation (ACHP) in protecting historic properties identified in a project area. Section 106 of the NHPA and its implementing regulations mandate identification of cultural resources which would be potentially affected by project activities and that the Air Force address the effects of the undertaking on such resources. §36 CFR 60 establishes the National Register of Historic Places (NRHP) and defines the criteria for evaluating eligibility of cultural resources to the NRHP.

The Archaeological Resources Protection Act of 1979 (§16 USC 470a-47011, as amended) protects archaeological resources on Federal lands. If an agency discovers archaeological resources during site activities, the act requires permits for excavating and removal of any archaeological resources.

## **2.0 ALTERNATIVE ANALYSIS**

This Section describes the elements of the No Action Alternative, Other Alternatives analyzed and rejected, and the Proposed Action including the construction of 65 new duplex units that will provide 130 residences.

### **2.1 No Action Alternative**

The No Action Alternative would result in no construction by the Air Force in the Jupiter Village neighborhood. Due to the severe shortage of family housing units at Malmstrom AFB, if these houses are not constructed, 130 soldiers and their families will be forced to rent or purchase housing off base. Thus, the No Action Alternative would result in a decrease in readiness, morale and base unity.

### **2.2 Other Alternatives Analyzed and Rejected**

### **2.3 Proposed Action**

The Proposed Action involves the construction of approximately 130 housing units (65 structures). The current project schedule assumes documents are Ready To Advertise (RTA) on 18 August 2004. Anticipated proposal due date is October 2004. Construction is tentatively set for January 2005, at the direction of Air Staff Command.

#### **2.3.1 Demolition**

The west construction site was previously cleared of housing units and graded. The houses previously located on the east construction site were relocated as well. After relocation the foundations were demolished and the site was restored to its natural grade. These housing units were donated to the following local Indian tribes for use through the Walking Shield Program:

- Fort Belknap received 22 housing units (11 duplexes) and 15 garages.
- Northern Cheyenne received 27 housing units (13.5 duplexes) and 14 garages.
- Rocky Boy received 131 housing units (65.5 duplexes) and 67 garages. (Information provided from Cindy O'Connel at Malmstrom at 406-731-6209)
- 90 storage sheds were also removed and either relocated or disposed of, based on condition (D. Geertz, Pers. Comm., April, 2004).

All utilities are underground. Previous units were heated with natural gas-fired forced-air furnaces. Other buried utilities include water and sewer, telephone, and television cable. Telephone and electrical services were originally installed above ground, but have been buried during one of many interim renovations of these homes.

#### **2.3.2 Soil Borrow and Backfill**

Drainage problems have been identified along the northern most portion of the site (USAF 2004). Currently the site slopes from Perimeter Road to the west. The new development will use the same basic ground contours. It has been proposed to raise the low point along the western edge of the parcel approximately 2 feet. This will eliminate a localized low-point which will facilitate site drainage and alleviate standing surface water. The low point will be raised with approximately 15,000 cubic yards of fill material from a local permitted source off base. Dump trucks and dozers will be used to fill and grade the site to better contours. This action will be covered under a "Project Permit for Storm Water Discharges Associated with Construction Activity" obtained by the contractor from the Montana Department of Environmental Quality (DEQ). Additionally, the contractor shall submit a Storm Water Pollution Prevention Plan for approval by Malmstrom AFB and Montana DEQ personnel.

### ***2.3.3 New Home Construction***

Construction will commence following the completion of the fill work described above. The Proposed Action includes the construction of 130 new homes; 100 two-bedroom and 30 four-bedroom; all two story duplexes (Figure 2 and Figure 3, above). In addition, 20 units may be taken as an option from Phase 6 and added to Phase V if Air Staff approves the consolidation, resulting in 150 units to include full scope in the Phase V project. The homes will be built on an elevated floor system bearing on grade beams. The units will be traditional wood-frame structures, and each unit will have an attached single car garage. The new homes will include amenities to match the current Air Force Family Housing Guide (USAF April 2004 DRAFT). These include items such as master bedrooms with ¾-bathrooms, separate living rooms and family rooms, outdoor patios with privacy fencing, additional arctic recreation rooms, and substantial storage area in the garages. All new structures will be built to current building codes.

Electrical, telephone and cable television service will be connected to the new homes using new service drops from existing main feeder lines. The existing water service will remain. Additional water feeds will be installed along Pecan and Filbert Streets to expand the water supply system. On the East site the sanitary sewer is adequate and will be used for the new construction. On the West site the sanitary sewer will be abandoned in place, including manholes, and reconstructed with new services routed and connected to the new homes.

The Proposed Action includes a jogging path to be built throughout the housing area to provide a walkway for residents and access to utilities for Base Personnel. Additionally, two play areas and two basketball courts are included in the FY 2005 construction contract.

The Proposed Action includes the construction of sidewalks to develop the sidewalk grid throughout the neighborhoods. In preparation for construction of these sidewalks and driveway curb cuts, and all existing curbs and gutters were removed crushed to be reused and recycled on future projects. Portions of Walnut, Pecan, Filbert, Chestnut, and Acorn Streets have been pulverized and left in place for future use. During construction the following streets may be altered, depending on the final plans from the AE firm:

- Pecan Street will be relocated to provide a new entrance to 74<sup>th</sup> Street North and,

- The north and south intersections of Walnut Street and Perimeter Road will be realigned to provide superior access.

## 2.4 Comparison of Alternatives

Table 4 summarizes the potential environmental impacts of the Proposed Action and alternatives, based on the impact analyses presented in Chapter 4.0. Potential environmental consequences are not significant with the implementation of the Proposed Action or no action alternatives.

**Table 3: Summary of Potential Environmental Impacts of Proposed Action and No Action Alternatives**

Resource	Proposed Action	No Action Alternative
Air Resources	0	0
Water Resources	0	0
Geological Resources	0	0
Biological Resources	0	0
Cultural Resources	0	0
Water Resources	-	-
Noise (Construction)	-	0
Health, Safety and Waste Management	0	0
Land Use (Transportation)	-	0
Socioeconomics and Environmental Justice	+	0
- = Adverse, but not significant impact + = Positive/beneficial impact 0 = No change		

This page left intentionally blank for duplicating purposes.

### 3.0 AFFECTED ENVIRONMENT

This chapter describes the affected environment at Malmstrom AFB. The existing environmental conditions within the expected geographic extent of potential impacts, known as the region of influence (ROI), are addressed for each environmental resource in this chapter.

#### 3.1 Air Resources

This section describes the existing concentrations of various pollutants and the climatic and meteorological conditions that influence the quality of the air in the area around Malmstrom AFB. Precipitation, wind direction and speed, and atmospheric stability conditions are factors that determine the extent of pollutant dispersion.

The type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences determine air quality. Comparing it to federal and/or state ambient air quality standards determine the significance of a pollutant concentration in a region or geographical area. Under the authority of the Clean Air Act (CAA), the United States Environmental Protection Agency (USEPA) has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety.

These federal standards, known as the National Ambient Air Quality Standards (NAAQS), represent the maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), respirable particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). Based on measured ambient criteria pollutant data, the USEPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Nonattainment areas that achieve attainment are subsequently redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for the USEPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

In 1997, the USEPA promulgated two new standards: a new 8-hour O<sub>3</sub> standard (which will eventually replace the existing 1-hour O<sub>3</sub> standard) and a new standard for particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>), which are fine particulates that have not been previously regulated. In addition, the USEPA revised the existing PM<sub>10</sub> standard. The two new standards are scheduled for implementation over the next few years, as monitoring data becomes available to determine the attainment status of areas in the United States. Meanwhile, the USEPA will enforce the existing 1-hour O<sub>3</sub> standard for areas that are still in nonattainment of the standard.

Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. For selected criteria pollutants, the State of Montana has established its state AAQS, some of which are more stringent than the federal standards. Montana AAQS are more restrictive than federal standards for CO, NO<sub>2</sub>, O<sub>3</sub>, and SO<sub>2</sub>. Montana does not have state standards for PM<sub>2.5</sub>. In addition, Montana regulates emissions of settleable particulates, visibility, fluoride in foliage,

and hydrogen sulfide (H<sub>2</sub>S), for each of which no federal standards exist. A summary of the federal and Montana AAQS that apply to the proposed project area is presented in Table 5.

**Table 4: Montana and Federal Ambient Air Quality Standards**

Air Pollutant	Averaging Time	Montana AAQS	Federal (NAAQS)	
			Primary	Secondary
Carbon Monoxide (CO)	8-hour	9 ppm	9 ppm	---
	1-hour	23 ppm	35 ppm	---
Nitrogen Dioxide (NO <sub>2</sub> )	AAM	0.05 ppm	0.053 ppm	0.053 ppm
	1-hour	0.30 ppm	---	---
Sulfur Dioxide (SO <sub>2</sub> )	AAM	0.02 ppm	0.030 ppm	---
	24-hour	0.10 ppm	0.14 ppm	---
	3-hour	---	---	0.50 ppm
	1-hour	0.50 ppm	---	---
Particulate Matter (PM <sub>10</sub> )	AAM	50 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	24-hr	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> ) <sup>(a)</sup>	AAM	---	15 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>
	24-hour	---	65 µg/m <sup>3</sup>	65 µg/m <sup>3</sup>
Ozone (O <sub>3</sub> ) <sup>(b)</sup>	1-hour	0.10 ppm	0.12 ppm	0.12 ppm
	8-hour	---	0.08 ppm	0.08 ppm
Lead (Pb) and Lead Compounds	Calendar Quarter	---	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>
	90-days	1.5 µg/m <sup>3</sup>	---	---
	Settleable Particulates (TSP)	30-day	10 g/m <sup>2</sup>	---
Hydrogen sulfide (H <sub>2</sub> S)	1-hr(d)	0.010 ppm	---	---
	½-hr(e)	0.100 ppm	---	---
	½-hr(f)	0.030 ppm	---	---
Fluoride in foliage	1-month	50 µg/g	---	---
	grazing season	35 µg/g	---	---
Visibility	AAM	3 x 10 <sup>-5</sup> /m	---	---

Notes: AAM = Annual Arithmetic Mean; AGM = Annual Geometric Mean.  
ppm = parts per million; µg/m<sup>3</sup> = micrograms per cubic meter.

(a) The PM<sub>2.5</sub> standard (particulate matter with a 2.5-micron diameter) was promulgated in 1997, and will be implemented over an extended time frame. Areas will not be designated as in attainment or nonattainment of the PM<sub>2.5</sub> standard until the 2003 – 2005 timeframe.

(b) The 8-hour Ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to areas not attaining it.

Sources: §40 CFR 50; USFS (2000)

For non-attainment regions, the states are required to develop a State Implementation Plan (SIP) designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines.

Section 162 of the CAA further established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the Prevention of Significant Deterioration (PSD) program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. Class II areas are those where moderate, well-controlled growth could be permitted. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas and are a pre-construction permitting system.

CAA Section 169A established the additional goal of prevention of further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will also address contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM<sub>10</sub> and SO<sub>2</sub> in the lower atmosphere.

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with the each state's SIP for attainment of the NAAQS. In 1993, the USEPA issued the final rules for determining air quality conformity. Federal activities must not:

- cause or contribute to any new violation;
- increase the frequency or severity of any existing violation; or
- delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases.

### *3.1.1 Climatology and Meteorology*

Malmstrom AFB, located in north central Montana, is on the dry eastern side of the Rocky Mountains and has a modified semiarid continental type climate. Summertime is generally pleasant, with cool nights, moderately warm and sunny days, and very little hot, humid weather. Winters are milder than would be expected of a continental location at this latitude because of the frequent occurrence of warm down slope winds (Chinooks) that produce temperature changes of 40° F or greater in 24 hours (USAF 1998). July is generally the warmest month, with a mean

daily high temperature of 83.6° F. January is usually the coldest month, with a mean daily low temperature of 12.5° F. The growing season averages 135 days per year (USAF 1999).

Humidity and precipitation are usually low, with associated large fluctuations in daily and seasonal temperatures. Average annual precipitation is 15 inches. Most of the precipitation that occurs during the late fall, winter, and early spring falls as snow, but Chinook winds prevent large accumulations (USAF 1998). Average annual snowfall is 43.6 inches (USAF 2000). The prevailing winds are from the southwest year round and are generally moderate with speeds exceeding 25 mph only two percent of the time (USAF 1999).

Based on the average annual precipitation, the area would normally be classified as semi-arid, but about 70 percent of the annual rainfall typically occurs during the April to September growing season, so the climate is favorable for dry land farming (USAF 1998). Table 6 presents average monthly temperatures, precipitation, humidity, and wind speed data from the nearest National Weather Service station in Great Falls, Montana (USAF 1999).

**Table 5: Climate Data for Great Falls, MT**

Month	Temperature		Precipitation		Relative Humidity 1		Wind
	Mean Daily Max °C (°F)	Mean Daily Min °C (°F)	Mean Total cm (in)	Mean Snow cm (in)	Mean (%)	Mean Speed m/s (mph)	Prevailing Direction
January	-0.5 (31.1)	-10.8 (12.5)	2.06 (0.81)	25.1 (9.9)	62	6.8 (15.3)	SW
February	2.3 (36.2)	-8.7 (16.3)	1.70 (0.67)	21.6 (8.5)	59	6.4 (14.3)	SW
March	5.8 (42.5)	-5.5 (22.1)	2.56 (1.01)	26.4 (10.4)	55	5.8 (13.0)	SW
April	12.9 (55.2)	0.2 (32.4)	3.15 (1.24)	18.5 (7.3)	47	5.1 (12.9)	SW
May	18.4 (65.1)	5.3 (41.4)	6.25 (2.46)	4.6 (1.8)	46	5.0 (11.4)	SW
June	22.9 (73.3)	9.5 (49.1)	6.75 (2.66)	0.8 (0.3)	44	4.5 (11.2)	SW
July	28.7 (83.6)	12.7 (54.9)	3.23 (1.27)	Trace	37	4.6 (10.1)	SW
August	27.6 (81.6)	11.9 (53.4)	3.40 (1.34)	Trace	39	5.1 (10.2)	SW
September	21 (69.8)	7.1 (44.7)	3.15 (1.24)	4.1 (1.6)	46	5.9 (11.3)	SW
October	15.1 (59.2)	2.6 (36.7)	1.96 (0.77)	7.9 (3.1)	46	6.5 (13.2)	SW
November	6.4 (43.6)	-3.7 (25.3)	1.82 (0.72)	19.1 (7.5)	54	7.0 (14.6)	SW
December	1.7	-8.2	1.85	22.6	60	7.4	SW

Month	Temperature		Precipitation		Relative Humidity 1		Wind
	Mean Daily Max °C (°F)	Mean Daily Min °C (°F)	Mean Total cm (in)	Mean Snow cm (in)	Mean (%)	Mean Speed m/s (mph)	Prevailing Direction
	(35.0)	(17.3)	(0.73)	(8.9)		(15.6)	
Annual	13.6 (56.4)	0.99 (33.8)	37.90 (14.9)	150.6 (59.3)	50	5.7 (12.8)	SW

1 Relative humidity measured at 11:00 a.m.  
2 Wind speed based on 1941-90 period; prevailing direction through 1963.

Source: Bair (1992).

### 3.1.2 Air Quality

The Proposed Action would occur within Cascade County, Montana. According to federally published attainment status for Montana in §40 CFR 81, Cascade County is designated as in attainment, better than the national standards, or unclassified for CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>, and Pb. Based on recent monitoring data, the USEPA projects that the Cascade County will be in attainment of the new 8-hour ozone and PM<sub>2.5</sub> NAAQS when designations are made in 2004 or 2005 (USEPA 2002). Monitoring data in Cascade County indicate generally good air quality.

The City of Great Falls has a small area located along 10th Avenue South that had previously been classified as nonattainment or unclassifiable for carbon monoxide (CO). This area was redesignated as attainment on 8 July 2002, and is now considered to be a maintenance area for CO. With the redesignation, the area is subject to a limited maintenance plan until 2012, after which it must submit a revised maintenance plan to last another 10 years. If no exceedances of the ozone standard occur within the next 20 years, the area may apply for full attainment status.

Malmstrom AFB is located in Montana Air Quality Control Region (AQCR) 141, which covers north central Montana. Mandatory PSD Class I areas for the state of Montana are listed under 40 CFR 81. Lewis and Clark National Forest, Scapegoat Wilderness, Helena National Forest, and Gates of the Mountain Wilderness are Class I areas not within 50 miles of the project area and Malmstrom AFB. The Flathead Indian Reservation, west of Great Falls, is a non-mandatory Tribal Class I area, which requires similar protection as mandatory Class I areas.

Emissions at military installations generally include CO, volatile organic compounds (VOCs), nitrogen oxides (NO<sub>x</sub>, commonly measured as nitrogen dioxide), sulfur oxides (SO<sub>x</sub>, commonly measured as sulfur dioxide), and PM<sub>10</sub>. Although O<sub>3</sub> is considered a criteria pollutant and is measurable in the atmosphere, it is not often considered a pollutant when reporting emissions from specific sources. O<sub>3</sub> is not typically emitted directly from most emissions sources; it is formed in the atmosphere from its precursors (NO<sub>x</sub> and VOCs), which are directly emitted from various sources. Thus, NO<sub>x</sub> and VOCs are commonly reported instead of O<sub>3</sub>. Sources of pollutants include stationary sources (fossil fuel combustion and fuel or solvent evaporation), construction activities, and mobile sources.

## 3.2 Water Resources

Water resources consist of groundwater and surface water. The ROI for water resources is considered to be within the limits of Malmstrom AFB. Located on a plateau with drainage northward toward the Missouri River, drainage features in the study area are primarily ephemeral streams and coulees. Potable groundwater is present at depths greater than 100 feet below ground surface. All water used at Malmstrom AFB is supplied by the City of Great Falls and is treated surface water from the Missouri River.

### 3.2.1 Groundwater

Groundwater resources exist in the project area and occur primarily in deep, confined aquifers (e.g., the Madison-Swift aquifer). The depth to these deep aquifers ranges between about 100 feet and 200 feet below land surface at the base. Shallow groundwater (less than about 25 to 40 ft below land surface) occurs locally as noncontiguous, unconfined, perched zones. The deep confined aquifers in the area tend to flow northward; flow in the shallow, unconfined aquifers typically follows topographic gradients.

The deep Madison-Swift aquifer has the greatest potential for future groundwater development. Because of the limited supply of water and discontinuous nature of the shallow perched zones, they are unlikely to be used as a water source in the future. Due to the ample surface water supply and the depth of most of the aquifers, groundwater resources have not been developed on the base.

### 3.2.2 Surface Water

The base lies on a plateau roughly 10 square miles in extent that drains northward toward the Missouri River. The Missouri River is located about one mile north of the base and serves as the principal source of potable water for Malmstrom AFB and the city of Great Falls. The U.S. Fish and Wildlife Service (USFWS) has classified the Missouri River as a Wild and Scenic river from the confluence with the Teton River to the confluence with the Musselshell River, a stretch of 150 miles northeast of Malmstrom AFB.

Surface water drainage at the site occurs primarily through open storm ditches with perennial flow, and in ephemeral streams and coulees (Figure 4). Stormwater drainage from Malmstrom AFB flows through a system of underground pipes, ditches, swales, and natural drainages to reach the Missouri River. Stormwater discharge is regulated by an MPDES permit to the Base from the Montana Department of Environmental Quality.

Figure 4: Surface Water Drainage Patterns at Malmstrom AFB

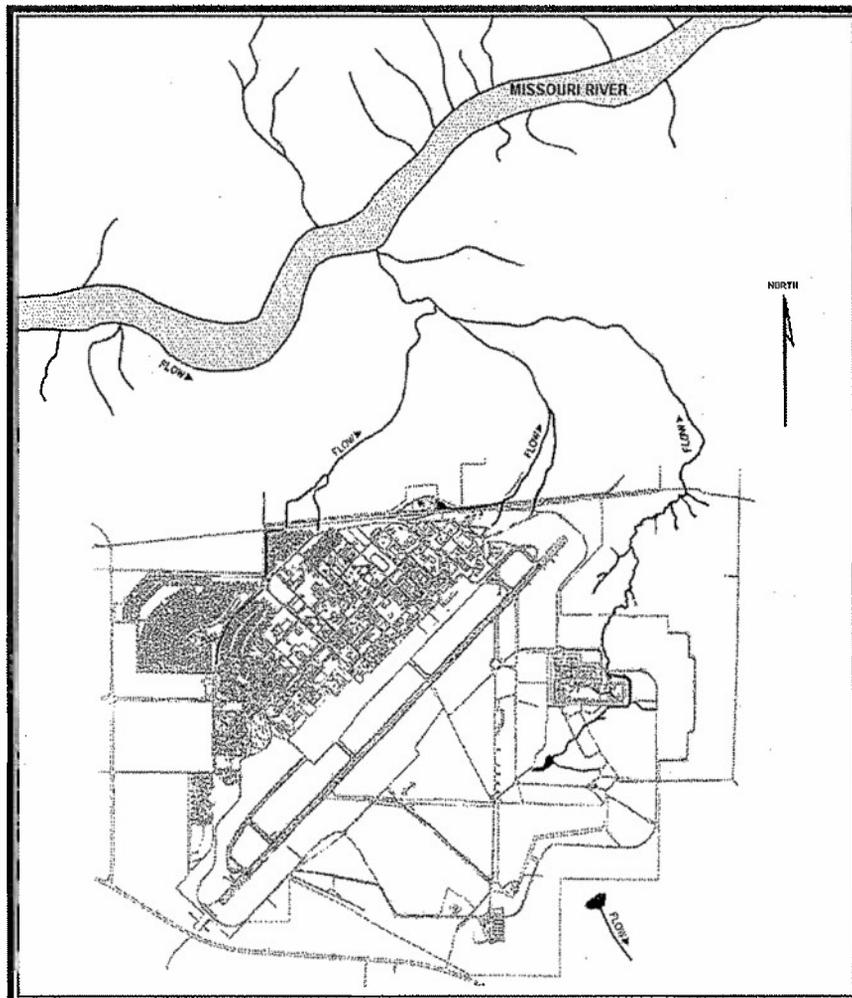
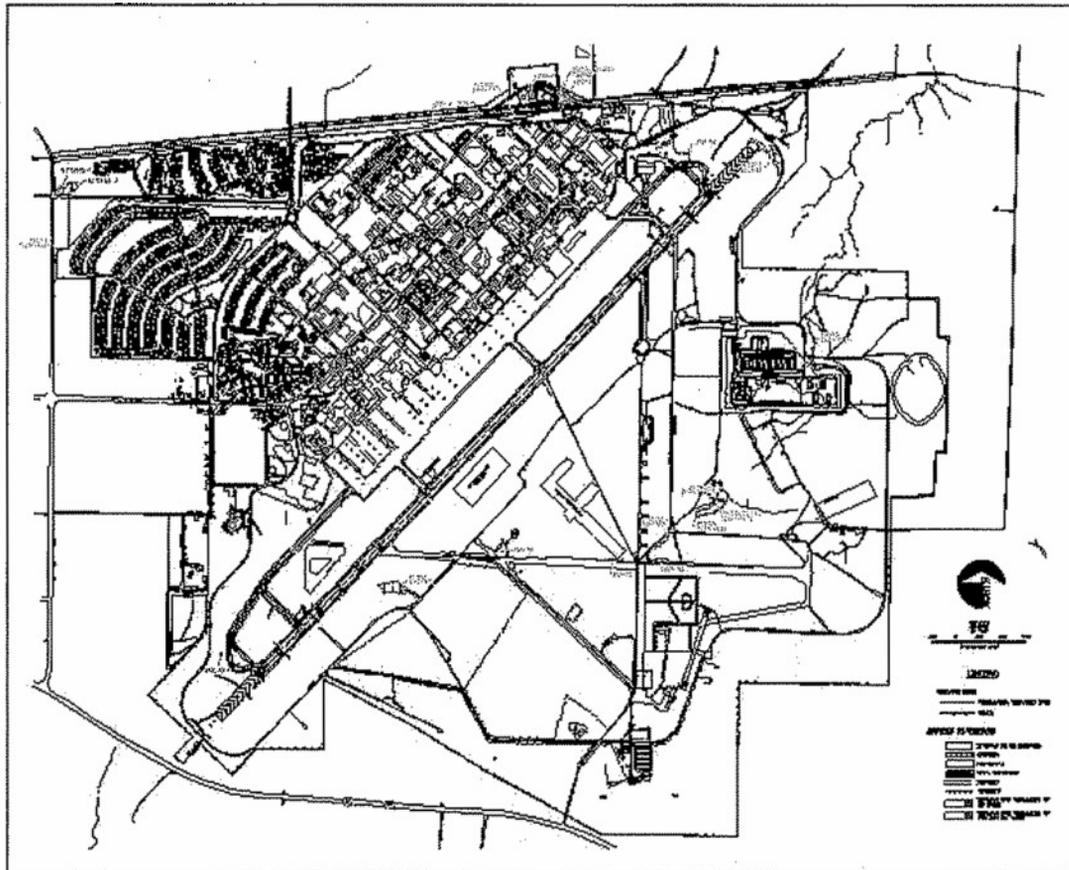


Figure 5: Wetlands in relation to project area at Malmstrom AFB.



### 3.3 Geological Resources

Geological resources include geology, seismicity and soils. The ROI for geological resources is within Malmstrom AFB boundaries.

Malmstrom AFB is located in a glaciated portion of the Missouri Plateau which in the northern part of the Great Plains Province. The site is underlain by the Sweetgrass Arch, a bedrock structural feature extending northwest between the Little Belt Mountains, 24 miles to the south, past the Base on the southwestern side and into Alberta, Canada. Stratigraphic units important to the framework of the region surrounding Malmstrom range in age from the Madison Limestone of the Mississippian era (360 million years) to the Eolian Sand of the Holocene (10,000 years). These units include sedimentary bedrock formations, unconsolidated glacial deposits, and windblown deposits. The occurrence of geologic hazards in the study area is low. Widely scattered, low-level seismicity characterizes the area. No active faults are near the project area or Malmstrom AFB and the proposed construction sites do not include significant areas of steep slopes.

In the vicinity of Malmstrom AFB, Quaternary glacial deposits overlie Early Cretaceous shale and sandstone formations. The modern soils of Malmstrom AFB have developed directly on

these Quaternary deposits and consist primarily of Lawther silty clay (associated with the Pleistocene till) and Dooley sandy loam (associated with the Holocene eolian sand) (SCS 1982). These two series encompass approximately 75 percent of the base. Other soils on base include sandy loams, loamy sands, and alluvial silty clay loams. Most of the soils on Malmstrom AFB are not highly subject to wind or water erosion. According to the March 2004 Geotechnical report from Thomas, Dean & Hoskins, Inc., "In general, the subsurface soil conditions encountered within the soil borings consist of sandy, lean clay and/or sandy soils near the surface underlain by fat clay and high-plasticity, lean clay. These heavy clay soils extend down to a depth of at least 26.5 feet, which was the maximum depth investigated." The following soils were documented in the Thomas, Dean & Hoskins, Inc. report.

- Sandy, lean clay was encountered directly below the topsoil and organics or at the surface in eight of the eleven soil borings. The sandy, lean clay may represent site grading fill or a disturbed layer associated with the former housing development. The thickness of sandy, lean clay averaged nearly 2.5 feet. The natural moisture content measured an average of 11 percent.
- Clayey sand or silty sand was observed in five of the borings. Three occurrences were directly below the topsoil layer or surficial sandy, lean clay while two were observed as interbeds within the fat clay and high-plasticity, lean clay soils.
- Fat clay and/or high-plasticity, lean clay was encountered in each boring generally below the surficial sandy, lean clay (in eight borings), the silty/clayey sands (in two borings) or directly at the surface (in Boring B-11). This material is slightly to moderately compressible as indicated by the consolidation test results. These figures also show that the samples exhibit slight to moderate expansion upon inundation at a surcharge pressure of 1000 psf.

### **3.4 Biological Resources**

Biological resources of the region provide economic, social, cultural, and environmental value. The plants, animals, and land in the vicinity of Malmstrom AFB are important for biological productivity and landscape continuity.

#### **3.4.1 Vegetation, Wetlands, and Floodplains**

Malmstrom AFB is located on a high plateau approximately one mile south of the Missouri River and is approximately 100 feet above the 100-year floodplain of the river (USAF 1998). The base is located on flat to gently rolling terrain in the Shortgrass Prairie region of the United States. Most indigenous vegetation within the boundaries of the base and in the general vicinity has been replaced with exotic and weedy species over the past 60 years of site development. Some noxious weed populations of spotted knapweed, Canada thistle, and field bindweed are known to occur on the Base (USAF 2001b). Currently, the site is a mixture of turf grasses and small shrubs left over from previous housing development. Malmstrom AFB is bordered on the north, east, and south sides by agricultural and pasture lands, with mixed commercial, industrial, residential, and open land uses to the west and northwest (USAF 2001b).

Currently the vegetation is a mix of introduced grass species with a low percentage of native grasses of a mixed-grass steppe. Approximately 36 acres of wet areas and moist seeps were identified on Malmstrom AFB and range from standing water (Pow Wow Park) to streambeds that flow only after heavy precipitation (USAF 2001b); this delineation determined that there were no wetlands within the project area. In most cases, these other were areas associated with sewage lagoons or other drainage areas. In general, woody vegetation is rare within the project area, is consists primarily of trees remaining from previous housing use, and recruited species. There are no other ditches or creeks and no evidence of seeps or springs.

No threatened or endangered plant species have been identified in the study area (USAF 1994b, Montana Natural Heritage Program [NHP] 2003).

### **3.4.2 Wildlife**

Effective wildlife habitat is limited in the study area by the relatively large portion of land used for buildings, runways, and other base facilities (USAF 2001b). Bird species of greatest abundance include a variety of songbirds, shorebirds, raptors, and waterfowl. Common mammals include the white-tailed jackrabbit, badger, skunk, ground squirrels, and field mice. There may be transient use of the area by coyotes. There are no native fish on base; Pow Wow Pond contains stocked rainbow trout (USAF 2001b).

No federally listed threatened or endangered species occur on Malmstrom AFB (Montana NHP 2003). Two federal-candidate bird species (ferruginous hawk and Swainson's hawk) and one state-recognized species (the upland sandpiper) may be migrants to the study area. Although no specific protective measures are required, consideration should be given to minimize disruption of their habitat. Threatened or endangered wildlife species do not impose a constraint to development on Malmstrom AFB (USAF 1998).

## **3.5 Cultural Resources**

Cultural resources are prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are typically divided into three major categories: archaeological resources, architectural / engineering resources, and traditional resources.

Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Architectural /engineering resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. They generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP). Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. They may include archaeological resources, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals. Significant cultural resources are evaluated for adverse impacts from a federal undertaking. Significant cultural resources are generally those that are eligible or potentially

eligible for inclusion in the NRHP. Native American or other ethnic groups also may identify traditional resources as significant. The ROI for cultural resources consists of Malmstrom AFB. The APE consists of the housing areas to be constructed, and the haul route.

### **3.5.1 Historical Setting**

Cultural frameworks for the region have been developed by Mulloy, Wedel, Frison and others (USAF 1995b), defining three major periods of human culture prior to contact with Euro-Americans. The people from the earliest period, from as long ago as 12,000 years to about 7,000 years ago, lived by hunting large game such as the now-extinct mammoth, and later deer, bison and smaller mammals. They used distinctive lanceolate spear points known as Clovis, Folsom and Plainview (USAF 1995b). Archaeological evidence from this period in the vicinity of Malmstrom AFB is usually in the form of surface sites or isolated finds, and there is little evidence for other aspects of their culture.

During the middle period, from about 7,000 to 1,500 years ago, there is evidence that bison were an important part of the economy, as well as remains of activities other than hunting, including plant collection, cooking, and food storage. Archaeological sites include a variety of projectile points, ground stone tools, and in the latter part of this period, ceramics (USAF 1995b). In the vicinity of Malmstrom AFB archaeological sites are found both on the surface and buried. However, the deposition on base precludes material being deeply buried.

In the most recent period prior to contact with Euro-Americans, from about 1500 to 300 years ago (about A.D. 1700) the variety of projectile points increases and pottery is more evident. Bison were still an important component on the economy, and stone circles are a distinctive type of site associated with this period. During the 18<sup>th</sup> century, prior to face-to-face contact, horses and trade goods such as beads and metal points made their way to this region through trade (USAF 1995b). Archaeological sites are found both on the surface and buried. When Euro-Americans contacted the Native Americans of this region, they identified Blackfoot, Crow, Plains Cree, Gros Ventre, Teton Dakota and Assinboine living a highly mobile life centered around bison hunting during the warm part of the year and village dwelling in sheltered areas such as river valleys during the cold seasons (USAF 1995b). Use of tipis and horses helped make this possible.

French and British fur traders had come through the upper Missouri River area prior to Lewis and Clark's Voyage of Discovery, but in 1805 this expedition's portage around the Great Falls probably took them across what is now Malmstrom AFB. Their route went between Belt Creek and a point upstream of the city of Great Falls. This exploration presaged later settlements, including Fort Benton to the northeast of the base during the first half of the 19<sup>th</sup> century (USAF 1995b). Forts and trading posts were followed by gold prospectors in the 1850s and 1860s, and then cattle ranching in the period between 1860 and 1880. The severe winter of 1886-1887 set the stage for sheep ranching to follow cattle ranching as the dominant industry, capped by the Great Northern Railroad reaching Great Falls in 1893. Between 1890 and 1910 homesteading increased, with the accompanying grain production contributing to the economy (USAF 1995b). The Chicago, Milwaukee, St. Paul and Pacific Railroad ("Milwaukee Road") came to Montana, passing through Great Falls in 1909 (Montana Historical Society 2003); remnants of this route now forms part of the northern border of Malmstrom AFB.

The City of Great Falls continued to grow, and in 1941 the Army Air Corps developed Great Falls Municipal Airport for use by the U.S.S.R. as part of the Lend-Lease program (USAF 1995b). Construction of the base began in 1942. Initially known as East Base, it was renamed Great Falls Air Force Base in 1947, and in 1956 was again renamed, this time for vice commander Col. Einar Malmstrom following his death in a plane crash (USAF 1995b). In March 1961 construction began on the first launch facility at Malmstrom. The base was an important player during the Cuban Missile Crisis. Missiles formed an important part of the Malmstrom AFB mission, but over the years other aspects have been added. The 301st Air Refueling Wing was activated at Malmstrom AFB in 1988. HQ USAF redesignated the 341<sup>st</sup> Strategic Missile Wing as the 341<sup>st</sup> Missile Wing in September 1991. In July 1994, USAF Space Command took over as the Major Command replacing Air Mobility Command.

Malmstrom AFB now hosts the 819<sup>th</sup> RED HORSE squadron. RED HORSE, acronym for Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer, is the first Active Duty and Air National Guard associate unit in the Air Force. The 341<sup>st</sup> Missile Wing was redesignated the 341<sup>st</sup> Space Wing in 1997.

#### Identified Cultural Resources

A search of the National Register Information System database shows that no National Register-eligible resources are located on Malmstrom AFB, although the city of Great Falls is home to a number of National Register-listed historic buildings.

Three archaeological and historic resources surveys have been conducted on Malmstrom AFB proper (USAF 2001b). In 1988 Historical Research Associates conducted a survey that found a segment of the Chicago, Milwaukee, St. Paul, and Pacific Railroad (now Burlington Northern Santa Fe) that traverses the northern border of the base (site 24CA 264). The railroad segment may be eligible for the National Register of Historic Places based on its role in the Euro-American settlement of the region (USAF 1995b), but it is outside the APE. An archaeological site in the southern part of the base is considered to be not eligible for the National Register. With the exception of isolated finds, no other cultural resources were identified within Malmstrom AFB.

Malmstrom AFB conducted an architectural inventory in 1996 to identify Cold War resources. The inventory also identified a number of buildings that are eligible, potentially eligible or potentially eligible pending additional background research (USAF 2001b). None of these facilities are within the APE of the Proposed Action.

Significant paleontological resources do occur in Montana, mostly in surface to near-surface bedrock. However, the project area and Malmstrom AFB are underlain by 30 to 100 feet of glacial sediments, which do not tend to produce paleontological finds, and none have been found on the Base (USAF 2001b). Upland areas, on which the project area and Base are located, also have a lower potential for cultural and historic sites than riparian areas.

Previous contacts with the Montana Historic Preservation Office confirmed the presence of only one known National Register-eligible cultural resource (historic railroad tract segment) adjacent to, but not within the proposed project area (USAF 2001b).

### 3.6 Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales that are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most commonly used is the *A-weighted sound level* or *dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called  $L_{eq}$ . The most common averaging period is hourly, but  $L_{eq}$  can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night—because excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Day/Night Average Sound Level, or  $L_{dn}$* , is a measure of the cumulative noise exposure in a community, with a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. Table 7 categorizes the typical range of  $L_{dn}$  levels for neighborhoods.

Table 6: Typical Day-Night Noise Levels in Urban Areas in the United States

Description	Typical Range of $L_{dn}$ , dB	Average $L_{dn}$ , dB
Quiet suburban residential	48-52	50
Normal suburban residential	53-57	55
Urban residential	58-62	60
Noisy urban residential	63-67	65
Very noisy urban residential	68-72	70

Source: U.S. Environmental Protection Agency 1974.

### 3.6.1 Existing Noise Setting

This analysis assesses noise levels in the residential areas where construction will occur. The most recent Air Installation Compatible Use Zone (AICUZ) analysis was completed in 1994 (USAF 1994a), when the 341<sup>st</sup> ARG was still assigned to Malmstrom AFB. The base does not currently host an active air wing, thus the runway is currently inactive, with the exception of Huey helicopters used by the 819<sup>th</sup> RED HORSE Squadron. The 1994 AICUZ analysis shows the residential area outside of the 65 dB contour deemed acceptable for residential housing (with sound attenuation materials present).

#### 3.6.1.1 Residential Areas

Vehicular traffic is the primary source of noise within the residential areas. Single family and duplex homes line the streets and a medical clinic is currently operating at the intersection of Perimeter Road and Clinic Court. Perimeter Road bisects the two residential areas included in the Proposed Action and is a primary arterial for on-base travel. However, Perimeter Road is blocked for further travel at Plum Street, so it is not a through street to the Main Gate from the subject residential areas. Noise from vehicular traffic will rise to levels present prior to the removal of houses within the construction site. This increase in noise will not adversely affect local buildings or neighborhoods.

The noise experienced by residential and other noise-sensitive receptors varies according to their distance from the roadway and the number of intervening residences. (Noise typically is attenuated, or reduced, 6 dB for every doubling of distance. In addition, one intervening row of houses reduces noise about 5 dB; additional rows reduce noise by about 10 dB.)

Ambient noise levels at the areas closest to Perimeter Road are expected to be comparable to those described in Table 6 as "urban residential." Those residences farthest from Perimeter Road will likely experience noise that is comparable to that described under "normal suburban residential."

### **3.7 Health, Safety, and Waste Management**

This section describes programs and activities currently in place at Malmstrom AFB including general public health and safety responsibilities, worker health and safety protection, solid and hazardous waste management, sewage and storm water management, environmental remediation activities, pesticide application, and harmful substances in the ROI.

#### **3.7.1 Public Health Management**

The USAF and agencies of the City of Great Falls, Cascade County, the State of Montana, and the federal government protect public health and safety at Malmstrom AFB. The city and county provide police protection and emergency services; the Cascade County Health Department is responsible for monitoring public health and safety issues such as drinking water quality and disease control. The Montana Department of Environmental Quality regulates waste management, toxic substance reporting, and investigation and cleanup of contaminated sites. The State of Montana also provides technical and financial assistance for occupational health concerns such as asbestos control, radon emissions, and drinking water. The 341 CES/CEV provides regulatory guidance to Malmstrom AFB personnel regarding safe use, storage, and disposal of hazardous and toxic substances and has a pollution prevention program that includes minimization of hazardous wastes and recycling. The Environmental Office of the Montana Department of Military Affairs provides the same oversight and guidance for state-operated National Guard facilities.

#### **3.7.2 Worker Safety and Health**

Construction activities on-base are governed by the rules and regulations of the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) as codified in §40 CFR 1910 Occupational Safety and Health Standards.

#### **3.7.3 Solid and Hazardous Waste Management**

Solid and hazardous waste programs provide for the collection, handling, and disposal of waste materials, response operations to spills of hazardous materials or waste, and management of the Installation Restoration Program (IRP). In Montana, hazardous and solid waste issues are regulated by the Montana Department of Environmental Quality.

At Malmstrom AFB, the solid and hazardous waste programs are managed by the Environmental Flight (341 CES/CEV). The responsibility to develop a Spill Prevention and Response Plan, provide procedures for spill reporting, containment, cleanup, and disposal, resides with the Environmental Flight. The fire department requests support, as needed, from local volunteer departments in the event of a spill (USAF 1998).

Hazardous waste management consists of the collection, storage and transportation of hazardous wastes as defined by RCRA. A release of certain materials, such as JP-8 fuel, could result in the generation of hazardous wastes. Hazardous wastes are recorded and processed through the Environmental Management Office and Defense Reutilization and Marketing Office (DRMO) (USAF 1998).

Solid waste collection and disposal services are provided to the base by civilian contractors and the City of Great Falls. Material is taken off base to a private landfill.

#### **3.7.4 Sewage and Storm Water Waste Management**

Sewage wastewater from the base is discharged to the City of Great Falls which then manages waste under a service contract with a private sewage treatment management firm. Storm water is considered a wastewater discharge by the Clean Water Act. Storm water is discharged from the base in accordance with a Montana Pollution Discharge Elimination System (MPDES) General Discharge Permit for Storm Water Associated with Industrial Activity issued by the Montana DEQ. Precipitation that falls or melts in the study area is managed in accordance with the Malmstrom AFB Storm Water Pollution Prevention Plan (SWPPP; Malmstrom AFB 1998). The SWPPP also mandates that construction discharges and industrial discharges be managed through the approved stormwater and sewage systems, as appropriate.

#### **3.7.5 Environmental Remediation Activities**

The USAF is undergoing clean up of contaminated sites created by past activities under the Installation Restoration Program (IRP). Seven IRP sites at Malmstrom AFB are either under investigation or undergoing cleanup activities at Malmstrom AFB (USAF 1998). There are no active IRP sites within a mile of either the housing area or the proposed concrete stockpile/soil borrow area.

#### **3.7.6 Pesticides**

Past spraying of herbicides has occurred throughout the base and may have been sprayed on the Proposed Action site. Because herbicides used for base wide spraying were biodegradable and would have dissipated from the soil in less than a year, any herbicides applied by Malmstrom in the past would likely not be present at this time (USAF 1999).

#### **3.7.7 Harmful Substances**

A radon survey of the base was performed by the Bioenvironmental Engineering office in September of 1988. The results of that survey indicated that Malmstrom AFB was categorized as Low Probability. This signifies that all structures sampled had less than four picocuries of radon concentration. At this level of concentration, no further action is required (USAF 1999).

- The construction site previously contained housing units that have since been removed. Thus, there are no indications of hazardous materials within the area.

### **3.8 Land Use**

This section describes land use, transportation, and visual resources on Malmstrom AFB. Land use focuses on general land use patterns, as well as management plans, policies, ordinances, and regulations. These provisions determine the type of uses that are allowable and identify appropriate design and development standards to address special use or environmentally

sensitive areas. Transportation addresses roads and circulation in the project area. Aesthetic qualities in the ROI are also described.

### **3.8.1 Land Use**

Land use on Malmstrom AFB includes developed areas in the northwestern portion of the installation and open space and weapons storage in the eastern portion (refer to Figure 2). The airfield, located in the southeastern portion of the installation, is the dominant land use on the installation. Light industrial and aircraft operations and maintenance are adjacent to the airfield. Other land uses in the cantonment area are generally located to the west of the airfield.

Housing is primarily located in the northwestern portion of the installation. Recreation facilities are scattered throughout the base in areas adjacent to the family housing area and also south of the weapons storage area on the east side of the base. Pow Wow Park is located in the east portion of the installation and includes a manmade pond for fishing. The park also includes playground equipment and a picnic area.

Adopted plans and programs guide land use planning on Malmstrom AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development. The *Malmstrom AFB General Plan* (Malmstrom AFB 2002) provides an overall summary of strategic planning initiatives. The plan includes six components (Composite Constraints and Opportunities, Infrastructure, Land Use, Capital Improvements Program, Facilities Excellence Plan, and Five-Year Plan), which represents a summary of current base plans. The base's *Integrated Natural Resource Management Plan*, (USAF 2001b) is used to coordinate natural resource management.

The *AICUZ Study, A Citizen's Brochure* (USAF 1994a) provides a summary of the AICUZ program. The Malmstrom AFB AICUZ study includes an analysis of the effects of noise, aircraft accident potential, and land use and development on Malmstrom AFB and its neighbors.

### **3.8.2 Transportation**

Access to Malmstrom AFB is provided from US Highway 87/89, east of Interstate 15 (refer to Figure 2). The Main Gate located on 2<sup>nd</sup> Avenue North and the Commercial Gate (North Gate) on 10<sup>th</sup> Avenue North provide access to the base. Second Avenue North becomes Goddard Avenue which serves as the main thoroughfare. Tenth Avenue becomes 72<sup>nd</sup> Street North and intersects Goddard Avenue. Both entrance routes connect to 57<sup>th</sup> Street North (Northeast Bypass - Montana Department of Transportation [MDT] Route 5205).

Seventy five percent of base traffic enters the base through the Main Gate and the remaining 25 percent enter through the North Gate (USAF 2001a). Peak traffic hours are between 6:45 am to 7:30 am and 4:30 pm to 5:00 pm (Stordahl 2003). The majority of traffic is vehicular in nature, although there are school buses that provide transportation service to children on the base.

### **3.8.3 Visual Resources**

Malmstrom AFB is located to the east of the city of Great Falls in rolling plains about 75 miles east of the Rocky Mountains. Malmstrom AFB lies at an elevation of 3,525 feet above sea level on a plateau (Malmstrom AFB 2002). The topography is characterized by broad, gently sloping plains that have been moderately dissected by numerous streams.

The base occupies 3,600 acres. The airfield runway occupies the largest portion of the installation. The base maintains a consistent design standard that has resulted in a uniformity of architectural design. The residential area specifically reflects modern colonial or ranch style one and two story homes with overlapping plank siding (or aluminum, if upgrades have occurred) and symmetrical window and door placement.

Little native vegetation currently exists on Malmstrom AFB. Native vegetation has been altered or modified by developmental activities and the introduction of exotic grasses (Malmstrom AFB 2002).

### **3.9 Socioeconomics and Environmental Justice**

#### **3.9.1 Definition of the Resource**

Socioeconomic resources for this analysis are characterized in terms of population and employment, with a particular emphasis on minority, low-income and youth populations. For the purposes of this analysis, the ROI is Malmstrom AFB, with some information provided for Cascade County.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities. An analysis of environmental justice helps determine if actions of federal agencies disproportionately and adversely impact the human health and environmental conditions in minority and low-income communities. The approach applied in this section is in accordance with the *Interim Guide for Environmental Justice within the Environmental Impact Analysis Process* (USAF 1997).

In addition to environmental justice issues are concerns pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

#### **3.9.2 Population and Employment**

There are 3,409 active duty military personnel assigned to Malmstrom AFB, of this number 1,749 (52 percent) reside on base while the remainder live off the installation. Family members and dependents of these personnel amount to 4,500 persons. In addition, Malmstrom AFB employs 435 appropriated fund civilian employees and 728 non-appropriated fund civilians, contractors and private-business employees. Total base population, including military personnel, civilian workers and dependents, totals 9,072 persons (Malmstrom AFB 2002).

The City of Great Falls is the seat of Cascade County and the second largest city in Montana with a 2000 population of 56,690 persons, accounting for 70 percent of the county population of

80,357 persons (U.S. Census 2000). Cascade County is home to 32,547 households with an average household size of 2.41 persons. In the predominantly rural area, Great Falls is largely dependent upon the fluctuations of the agricultural industry. Due to the area's natural terrain, Great Falls residents enjoy a high quality of life attributable to the numerous recreational opportunities and natural wildlife habitat in the area.

The operation of the base makes an important contribution to the economy of the region through both direct employment and purchases from local businesses. The presence of the base provides economic stability to the city and the region. Malmstrom's annual payroll obligates \$151.6 million to military and civilian employees, and the Air Force contributes an estimated \$97.9 million in construction and service contracts and other purchases from local businesses. Malmstrom AFB has a total annual economic impact of over \$282 million on a 50-mile radius that includes the counties of Cascade, Judith Basin, Lewis and Clark, Teton, Pondera, and Choteau (Malmstrom AFB 2002).

### ***3.9.3 Environmental Justice and Protection of Children***

Disadvantaged groups within the ROI, including low-income and minority communities, are specifically considered in order to assess the potential for disproportionate occurrence of impacts. For the purposes of this analysis, disadvantaged groups are defined as follows:

- *Minority Population:* Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders.
- *Low-Income Population:* Persons living below the poverty level, according to income data collected in U.S. Census 2000.
- *Youth Population:* Children under the age of 18 years.

Based on 2000 Census data, the incidence of persons in Cascade County with incomes below the poverty level was comparable to state levels accounting for 13.5 percent and 14.6 percent of the population, respectively (U.S. Census 2000). Nationally, 12.4 percent of the population lives below the poverty level.

Minority persons represent 10.5 percent of both the county and state populations. Native American and Aleut persons are the most predominant minority group in the county, representing 40 percent of the minority population, followed by persons of Hispanic descent who account for 23 percent of minorities. At the state level, Native Americans and Aleuts represent 60 percent of the minority population and Hispanic persons represent 19 percent of minorities (U.S. Census 2000). The youth population, which includes children under the age of 18, accounts for 26.0 percent of Cascade County's population, compared to 25.5 percent at the state level.



## 4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4.0 presents the environmental consequences of the Proposed Action at Malmstrom AFB for each of the resource areas discussed in Chapter 3.0. To define potential direct and indirect impacts, this chapter evaluates the project elements described in Chapter 2.0 against the affected environments provided in Chapter 3.0. Specifically, each resource considers the demolition of 100 homes, construction of 94 new homes, creation of a borrow pit for fill dirt, and the hauling and crushing/recycling of concrete and construction debris. Cumulative effects of the Proposed Action with other foreseeable future actions, as well as past and present activities, are presented in Chapter 5.0.

### 4.1 Air Resources

The significance of impacts to air quality is based on federal, state, and local pollution regulations or standards. Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally mandated federal Class I area.

According to USEPA's General Conformity Rule in §40 CFR 51, Subpart W, any proposed federal action that has the potential to cause violations, as described above, in a nonattainment or maintenance area must undergo a conformity analysis.

As previously discussed, Section 169A of the CAA established the PSD regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is more than 50 miles from the region potentially affected by the Proposed Action. Therefore, the Proposed Action could potentially have an impact on the PSD Class I areas identified in Section 3.1.2, depending on the emission levels associated with the Proposed Action.

#### 4.1.1 Potential Impact from Proposed Action

A military installation can constitute a major source of CO, VOCs, SO<sub>x</sub>, NO<sub>x</sub>, and PM<sub>10</sub> pollution. Sources of these pollutants include stationary sources (fossil fuel combustion and fuel or solvent evaporation), construction activities, and mobile sources. The Proposed Action, however, is a residential construction project not unique to a military installation.

Construction activities produce short-term combustion emissions (exhaust emissions from heavy equipment) and fugitive dust emissions (PM<sub>10</sub>), which would cease once construction is completed. Potential effects created from construction activities include road dust entrainment from construction vehicles and dust from temporary storage piles. Impacts can also result from increased vehicular emissions from construction vehicles, material hauling, and labor force transportation.

However, emissions generated by construction projects are short-term and temporary in nature. Fugitive dust emissions would be minimized and controlled by implementation of dust control measures in accordance with standard construction practices. For instance, frequent spraying of water on exposed soil during construction, proper soil stockpiling methods, and prompt replacement of ground cover or pavement are standard landscaping procedures that could be used to minimize the amount of dust generated during construction. Using efficient grading practices and avoiding long periods where engines are running at idle may reduce combustion emissions from construction equipment. Vehicular combustion emissions from construction worker commuting may be reduced by carpooling.

The Proposed Action would not increase the number of stationary sources at the Base and would not result in an increase in vehicular traffic. Therefore, the overall impact to air resources from the Proposed Action is likely to be short-term and not significant (minor).

#### ***4.1.2 Potential Impact from the No Action Alternative***

No impacts to air quality would result from the no action alternative, since the proposed housing phase would not occur.

## **4.2 Water Resources**

Water resources are surface and subsurface resources that are finite but renewable. Construction activities affect water resources by physical disturbances and material releases (e.g., sediment, chemical contaminants, etc.) into surface and groundwater. An impact to water resources at Malmstrom AFB would be considered significant if an aquifer, groundwater well, or surface water body is degraded resulting in a measurable and persistent change in a water supply or potential water supply. An impact would also be considered significant if surface or groundwater quality were degraded to a degree that exceeds federal or state water quality criteria. Increased recharge or improved water quality are examples of beneficial impacts.

#### ***4.2.1 Potential Impact from Proposed Action***

The Proposed Action will not be expected to significantly impact groundwater resources. Excavations at the housing construction sites will be shallow and will not intersect groundwater (except, possibly minor perched zones). Short-term impacts due to leaks or spills of contaminants during construction (e.g., fuels, lubricants) could possibly impact shallow perched zones; however, they would not be expected to enter the deeper confined aquifers and can be readily mitigated through implementation of appropriate construction/maintenance practices.

Short-term impacts to surface water could potentially occur during construction. These potential impacts could include increased turbidity in surface waters that are adjacent to construction activities and potential contamination due to leaks and spills of fuels and lubricants from construction equipment. Use of Best Management Practices (BMP's) and engineering controls as prescribed in the required SWPPP, and compliance with the protective provisions of the required Erosion Control Plan for the Proposed Action would significantly reduce the potential for construction-related impacts to surface water resources.

Replacement of existing housing units are not expected to result in a significant increase in impermeable surfaces, so no long-term impacts to groundwater recharge are expected. Likewise, long term impacts to surface water resources would not occur.

#### ***4.2.2 Potential Impact from No Action Alternative***

Under the no action alternative, the proposed housing development would not occur. The west construction site was previously cleared of housing units and graded. The houses previously located on the east construction site were relocated as well. After relocation the foundations were demolished and the site was restored to its natural grade. Adverse, but not significant impacts to water resources turbidity and erosion would be anticipated.

### **4.3 Geological Resources**

#### ***4.3.1 Potential Impacts from Proposed Action***

Slopes within the project area are generally gentle; however, water and wind erosion could occur during construction activities. Engineering controls described in Chapter 2.0 will reduce these impacts.

Many of the soils at the site are moisture sensitive, and have high clay content. These soils are expansive and have caused foundation related problems. Thomas, Dean & Hoskins, Inc. have developed a Geotechnical Investigation report for use on this housing project which includes site specific engineering considerations and controls that could mitigate the negative impacts of the soil conditions.

Therefore, no significant long term impacts to site soils are expected.

#### ***4.3.2 Potential Impact from No Action Alternative***

No impacts to geology or soils are expected under the no action alternative since this phase of the housing development would not occur.

#### ***4.3.3 Storm Water - Erosion and Sedimentation***

Storm water effects related to erosion and sedimentation from construction are negligible. Short-term impacts to surface water could potentially occur during construction. These potential impacts could include increased turbidity in surface waters that are adjacent to construction activities and potential contamination due to leaks and spills of fuels and lubricants from construction equipment. Use of Best Management Practices (BMP's) and engineering controls as prescribed in the required Storm Water Pollution Prevention Plan (SWPPP), and compliance with the protective provisions of the required Erosion Control Plan for the Proposed Action would significantly reduce the potential for construction-related impacts to surface water resources. Cumulative effects are also expected to be negligible. Only a minor increase in the amount of storm water runoff would be expected after construction of the Phase V Housing is complete. This minimal increase in storm water runoff, in the footprint of the Phase V Housing, would not cause a significant effect on the Malmstrom storm water system. The footprint contained family housing with lawns, roads and open grasses areas. The houses have been

removed, streets and foundations removed and the half the lawns have been graded. Construction of the Phase V Housing will improve the storm water by reducing turbidity and erosion within the footprint of the new facility.

The long-term changes to the Base's surface water runoff will be minimal. The new housing would increase the total impervious area by less than 2/10 of one percent. This small increase is not likely to accelerate erosion. Therefore, additional mitigation measures to channel water to settling ponds or similar are not necessary.

Malmstrom AFB is in the final stages of completing a project to put storm water system components underground. The new underground storm drain system will reduce erosion and turbidity of the storm water prior to leaving the base. Another project currently under construction is designed to allow storm water retention at the main storm water outfalls on the base. Each of these construction activities is designed to reduce erosion and turbidity of storm water prior to leaving the base.

Since, reasonable land, soil, and water conservation practices, measures or practices are to be incorporated in the design and used during construction. There is no need for water retention or settling basin within this project.

#### **4.4 Biological Resources**

Direct disturbances would include excavation and removal of existing habitat. Impacts to biological resources could also result from noise and dust generation during the construction of the site.

##### ***4.4.1 Potential Impacts from Proposed Action***

The proposed site is within a housing complex that consisted of housing units, paved roads, and small yards planted with turf grasses and a few landscaped shrubs. This site was recently demolished and returned to its original conditions.

Surface disturbance associated with the Proposed Action can result in an increased risk of invasion by noxious weeds. Prompt revegetation of all disturbed areas adjacent should be considered. Because of the limited amount of biological resources of the project area, the Proposed Action would have an insignificant impact on biological resources. In addition, no significant impacts to wetland areas, significant habitat areas, or threatened or endangered species are expected.

##### ***4.4.2 Potential Impact from No Action Alternative***

Under the Proposed Action, this phase of housing development and construction would not occur. Therefore, the limited biological resources within the ROI would not be impacted by the no- action alternative.

## 4.5 Cultural Resources

A number of federal regulations and guidelines have been established for the management of cultural resources. Section 106 of the National Historic Preservation Act (NHPA), as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have been identified as important to Native Americans as outlined in the American Indian Religious Freedom Act (AIRFRA) and EO 13007 Indian Sacred Sites. Department of Defense (DoD) *American Indian and Alaska Native Policy* (1999) provides guidance for interacting and working with federally-recognized American Indian governments. DoD policy requires that installations provide timely notice to, and consult with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or American Indian lands.

Analysis of potential impacts to cultural resources considers direct impacts that may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts generally result from increased use of an area.

### 4.5.1 Potential Impact from Proposed Action

All undisturbed areas at Malmstrom AFB have been surveyed and no National Register-eligible archaeological resources have been identified (USAF 1995a). Furthermore, the depositional environment is such that there is little potential for deeply buried archaeological remains (Malmstrom AFB 2002). It is extremely unlikely that the construction effort will affect archaeological resources because buried cultural material is unlikely to occur in the depositional environment.

Use of existing roads along the route proposed for hauling material to the construction site will not affect archaeological or architectural resources. Should improvements to existing roads be part of the Proposed Action, this also should have no effect on archaeological resources. However, construction of additional roads or widening the existing right-of-way would be considered a separate undertaking. It would be necessary to comply with Section 106 of the NHPA, including identification and NRHP evaluation of any affected resources.

The portion of the Chicago, Milwaukee, St. Paul and Pacific Railroad (site 24CA 264) that borders the northern boundary of the base will not be affected by the haul route.

In the unlikely event that archaeological resources are encountered in the course of any aspect of the Proposed Action, compliance with Section 106 of the NHPA, including NRHP evaluation of all identified resources, would be necessary prior to completing the Proposed Action. Contact with the Montana State Historic Preservation Office regarding this action is currently in process (refer to Appendix XX for correspondence). Impacts to traditional resources are not expected under the Proposed Action. No traditional resources have been identified to date within Malmstrom AFB.

#### 4.5.2 Potential Impact from No Action Alternative

Under the No Action Alternative, there would be no construction of new housing units. Thus, there would be no effects to cultural resources.

### 4.6 Noise Resources

#### 4.6.1 Potential Impact from Proposed Action

The residential areas where housing units will be constructed will experience construction-related noise impacts. Table 8 lists typical construction-related noise for several different types of construction. Typical noise sources include diesel engines on construction equipment (e.g., backhoes, front-end loaders, dump trucks), air compressors and jackhammers to demolish concrete structures, back-up horns on construction equipment, and movement of construction materials. Noise levels should be similar to those listed for Domestic Housing below.

Table 7: Noise Levels for Construction Phases

Phase	Typical Ranges of Energy Equivalent Noise Levels at Construction Sites ( $L_{eq}$ in dBA)							
	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation/Demolition	88	75	88	78	88	71	88	78
Foundations	88	81	78	78	77	77	88	88
Erection	88	65	87	75	87	72	75	78
Finishing	88	72	89	74	89	74	84	84

I = All pertinent equipment present at site.

II = Minimum required equipment present at site.

Source: USEPA, Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

The new construction is currently scheduled to last 16 months, although the impacts will vary depending on the phase of construction for a specific unit. Construction of homes in the Jupiter Village neighborhood will directly impact residents in the housing areas southwest of 67<sup>th</sup> Street. The existing Clinic at the intersection of Clinic Court and Perimeter Road will experience increased noise attributable to construction activities.

Based on Table 8, Finishing would be the single loudest phase of construction. Assuming this activity generated a maximum  $L_{eq}$  of 89 dBA, noise would exceed 60 dBA (the point at which construction noise could affect activity or speech communication outdoors and sleep indoors) at residential or other noise-sensitive receptors with a direct line-of-sight of the activity for a distance of 1,300 feet. Given the cleared nature of the site in the project area, noise wouldn't be attenuated by intervening structures at many locations. Thus, noise would be perceived as very loud while construction occurred in the same neighborhood.

Prior to the start of construction for this project the existing site will be regraded. This process will include the placement of approximately 15,000 cubic yards of fill material to level the site and thus allow better drainage. In residential neighborhoods, 20-cubic yard trucks and dozers would be used to deliver and grade the fill material before construction began. Noise associated with the construction of the houses in this project would come from delivery trucks such as lowboys and refuse hauling trucks. Assuming that all trucks used the same route (Perimeter Road), the trucks would generate approximately 62 dBA. This noise would not be distinguishable from the overall noise in areas where construction activities were underway. Noise would be more perceptible along the local streets that serve as primary access routes for larger areas (e.g., Perimeter Road and 67<sup>th</sup> Street), but impacts along these routes would not be significant given the limited amount of time noise exposure would occur (most areas would not experience increased truck noise for more than one construction season) and the fact that trucks would only be used during the daytime on weekdays.

One of the most essential elements in ensuring that noise impacts do not reach a level of significance is requiring that construction occur during daytime hours and on weekdays. All internal combustion engine-driven equipment should be equipped with mufflers that are in good condition. Although the construction traffic will have increased noise levels, they are not unlike the current intermittent industrial activity in the vicinity.

#### ***4.6.2 Potential Impact from No Action Alternative***

No impacts associated with noise are expected under the No Action Alternative, since this phase of the housing development would not occur. The haul route would not be used.

### **4.7 Health, Safety, and Waste Management**

#### ***4.7.1 Potential Impact from Proposed Action***

Worker safety is the primary health and safety concern during construction activities. There are inherent risks associated with construction operations. The contractor selected to implement the Proposed Action will be subject to rigorous safety management requirements as part of the contract with the Corps of Engineers. These requirements are primarily associated with OSHA

workplace safety practices. If the required safety precautions are enforced, no significant safety impacts are anticipated.

There are no existing hazardous or solid waste management concerns on the site.

#### ***4.7.2 Potential Impact from No Action Alternative***

This alternative presents no health, safety or waste management impacts since construction activity associated with this phase of the housing development would not occur.

### **4.8 Land Use**

The impact analysis for land use focuses on general land use patterns and land management practices. The methodology to assess impacts on individual land uses requires identification of those uses and determination of the degree to which those areas would be affected. Impacts to transportation are assessed with respect to the potential for disruption or improvement of current transportation patterns and systems; deterioration or improvement of existing levels of service, and changes in existing levels of safety.

Determination of the significance of the impact on visual resources is based on the level of visual sensitivity in the area.

#### ***4.8.1 Potential Impact from Proposed Action***

The proposed construction would occur in an area that previously had on-base housing, and would be consistent with surrounding land uses. The replacement housing units would meet current Air Force "whole house/neighborhood" standards and would be visually consistent with current and proposed housing design.

The Proposed Action is in accordance with the General Plan. New development would be designed and constructed to be architecturally consistent and compatible with existing facilities and structures. Landscaping for the new housing units would be provided using standards identified in the General Plan.

Construction traffic associated with the implementation of the Proposed Action would comprise only a small portion of the total existing on base traffic. Increases in traffic volumes associated with construction activity would be temporary and are not unlike volumes experienced during earlier housing development phases. Upon completion of construction, no long-term impacts to on-base transportation systems would result.

#### ***4.8.2 Potential Impact from No Action Alternative***

Under the No Action Alternative, the existing conditions would remain unchanged and impacts associated with land use, transportation, and visual resources would not occur.

#### **4.9 Socioeconomic and Environmental Justice Impacts**

In order to assess the potential socioeconomic and environmental justice impacts of the Proposed Action, employment, race, ethnicity, poverty status and age characteristics of populations in Cascade County were analyzed, as presented in Section 3.9. With regard to environmental justice and protection of children, county figures were compared to regional and state demographics to determine proportional differences. Areas containing relatively high environmental justice-related populations are given special consideration regarding potential impacts in order to address the potential of disproportionately high or adverse human health or environmental effects on these communities.

No long-term change in base employment or expenditures are anticipated as a result of the Proposed Action, which consists of a series of housing construction projects of relatively short duration (less than five years). All construction activity, including demolition, material hauling and recycling, is anticipated to occur within the boundaries of the base therefore negligible off-base socioeconomic or environmental justice impacts would be expected.

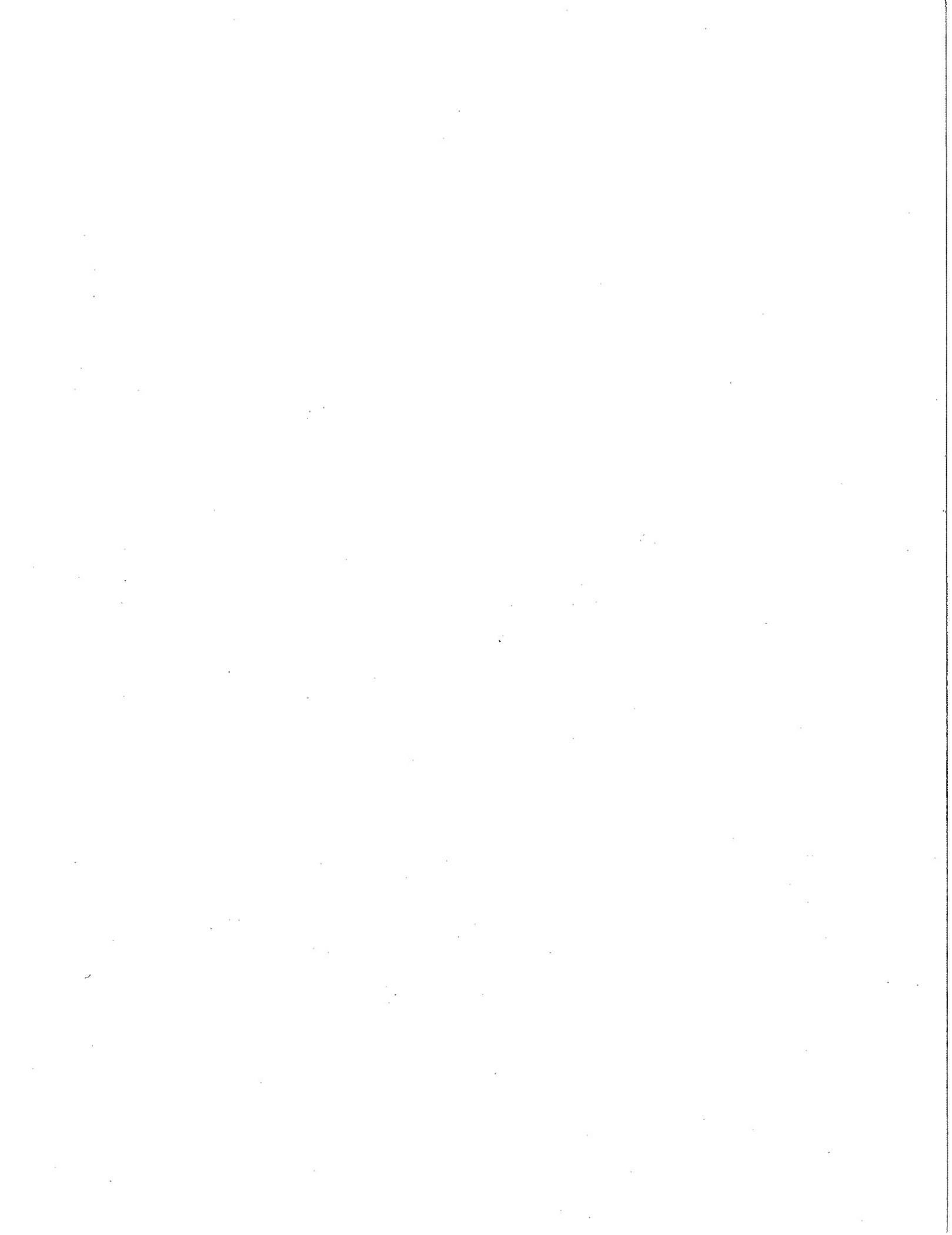
Construction-related noise impacts will occur in the affected residential areas surrounding the new housing sites. Noise impacts could be limited by restricting construction activity to daytime hours on weekdays. Appropriate measures should be taken to ensure that the generation of dust during construction and hauling of materials does not create any significant health or safety risks to children and other nearby residents.

##### ***4.9.1 Potential Impact from Proposed Action***

Construction activities associated with the Proposed Action could take place during FY2005 and involve expenditures of approximately \$29.91 million. The proposed construction activity would generate construction jobs and income and induce regional purchases and expenditures. These potential impacts would be temporary, however, only occurring for the duration of the construction period. No permanent or long-lasting socioeconomic impacts are anticipated as a result of implementation of the Proposed Action.

##### ***4.9.2 Potential Impact From No Action Alternative***

Under the No Action alternative, Malmstrom AFB would maintain its existing housing and not undertake the proposed new home construction as described in detail in Section 2.0. Failure to implement the proposed improvements would not generate any of the construction-related employment or earnings impacts associated with the Proposed Action. Implementation of the No Action alternative would not result in any significant adverse socioeconomic or environmental justice impacts.



## **5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

### **5.1 Cumulative Effects**

This section provides (1) a definition of cumulative effects, (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects, and (3) an evaluation of cumulative effects potentially resulting from these interactions.

#### **5.1.1 Definition of Cumulative Effects**

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (§40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographic and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with, or in close proximity to, the Proposed Action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA addresses three questions:

- (1) Does a relationship exist such that elements of the Proposed Action might interact with elements of past, present, or reasonably foreseeable actions?
- (2) If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
- (3) If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

In this EA, an effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action in this EA, these actions are included in this cumulative analysis. This approach enables decision makers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action.

### ***5.1.2 Past, Present, and Reasonably Foreseeable Actions***

This EA applies a stepped approach to provide decisionmakers with not only the cumulative effects of the Proposed Action, but also the incremental contribution of past, present, and reasonably foreseeable actions.

#### ***5.1.2.1 Past and Present Actions Relevant to the Proposed Action***

Malmstrom AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States defense policy that the Air Force must be ready to respond to threats to American interests throughout the world. The most recent mission change at Malmstrom was in 1997 when the 819<sup>th</sup> RED HORSE squadron was assigned to Malmstrom.

The Proposed Action is part of an ongoing phased plan to upgrade all of the on-base family housing. Of the 1,404 housing units on base at Malmstrom, upgrades have already occurred for 503 units. The base, like any other major institution, also requires new occasional construction, facility improvements, and infrastructure upgrades. Currently there is a draft EA in comment phase for the Corrosion Control Facility project. Phase 4 of the housing upgrade project has a current EA and FONSI signed (August 2004). The Heat Plant Upgrade has been categorically excluded from requiring an EA because the purpose of the project is maintenance. There is also a Base-wide storm retention basin and outfall upgrade project currently underway to address storm water handling issues.

#### ***5.1.2.2 Incremental Impacts of the Proposed Action with Reasonably Foreseeable Future Actions***

As stated above, the Proposed Action is part of an ongoing phased plan to upgrade all of the on-base family housing. In addition to the 130 units for FY 2005 (analyzed in this EA), 310 units are projected for FY 2006-2007, and 478 for FY 2007 and beyond.

### ***5.1.3 Analysis of Cumulative Impacts***

The following analysis examines how any impacts resulting from the Proposed Action at Malmstrom AFB might affect the impacts of these other actions and whether such a relationship would result in potentially significant impacts not identified when the Proposed Action is considered alone.

Although not significant, some potential cumulative impacts have been identified for the following environmental resources:

- **Air Resources:** Because of the nature of the development activities required, it is expected that any construction impacts on air quality will be short-term and limited to localized areas. However, prolonged construction activity may impact regional air quality attainment status.

- **Geological Resources:** Permanent changes to soil structure and stability can occur by disrupting and reworking certain soils. The activities would be limited to a small area and are insignificant when considered by themselves.
- **Noise Resources:** Noise from construction activities would represent an unavoidable impact. This impact is short-term for an individual residence, but will be evident over the 16-month construction schedule, lessening over the last three months (when finish work is being completed indoors) associated with this phase and a longer period when combined with the other phases.
- **Transportation:** Transportation alone was not identified as a short or long term impact. However, as multiple phases of housing construction occur, and particularly if soil backfilling is a component of future construction projects, on-base roads will begin to deteriorate.
- **Water Resources:** Short term increases in sediment in storm water discharged from the base during construction are possible, however best management practices implemented to control erosion required by storm water discharge permits will prevent any significant short term impacts. The long term quantity and quality of storm water discharged from the base will not be affected by the Phase V Housing Replacement project. The proposed new houses replace existing houses on existing streets and the storm water collection and total impervious surface will remain essentially the same. Future housing construction projects scheduled for Malmstrom AFB also consist of replacement of existing housing in the same locations and should not change the quality or quantity of storm water discharged from the base. No changes in cumulative environmental impacts to surface water are expected from the implementation of the proposed action. In addition, the Base is constructing a new retention basin for drainage area 1 and storm drain outfall system to address surface water runoff issues.

In light of past, present, and reasonably foreseeable future actions, USAF expects no significant cumulative impacts as a result of this project.

## **5.2 Irreversible and Irrecoverable Commitment of Resources**

NEPA requires that environmental analysis include identification of “. . . any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented.” Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irrecoverable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the demolition of a historic building).

For the Proposed Action, most resource commitments are neither irreversible nor irretrievable. Most environmental consequences are short-term and temporary (such as air emissions and noise from construction activities) or longer lasting but negligible.

The design team has specified that sustainable materials be used throughout the construction of this project. For example, the existing roads and associated concrete were crushed and will be reused for future projects.

- **Those limited resources that may involve a possible irreversible or irretrievable commitment under the Proposed Action include consumption of limited amounts of materials typically associated with interior and exterior housing construction (e.g., concrete, wiring, insulation, and windows). However, the amount of these materials used is not expected to significantly decrease the availability of the resources.**

## 6.0 REFERENCES

- Bair 1992. The Weather Almanac. Frank E. Bair. Published by Gale Research Inc. 6<sup>th</sup> Edition. 1992.
- Bazan and Associates Architects, Inc. Requirements Documents, Final Submittal. Prepared for U.S. Army Corps of Engineers, Seattle District. Contract Number DAC67-02-R-2014. March 2004.
- Hart Crowser 2003. Draft Hazardous Building Material Survey Report, Malmstrom Air Force Base, Montana. Prepared for U.S. Army Corps of Engineers, Seattle District. Contract No. DACA67-02-D-2002, Delivery Order No.13. March 31, 2003.
- Hydrometrics, Inc. 2001. Malmstrom Air Force Base Wetlands Delineation – Draft. Prepared for Malmstrom Air Force Base, Montana. October 2001.
- Lemke and Maughan 1977. Lemke, R. W., and E. K. Maughan. Engineering geology of the city of Great Falls and vicinity, Montana: U.S. Geological Survey Miscellaneous Investigations Series Map 1-1025, scale 1:24,000. 1977.
- Malmstrom AFB 1998. Malmstrom Air Force Base Storm Water Pollution Prevention Plan. Prepared by 341 CES/CEVC, Malmstrom AFB and submitted to the Montana Department of Environmental Sciences. November 1998.
2002. Malmstrom Air Force Base General Plan and 2002 Update.
- McLaughlin 2003. Personal communication with Bill McLaughlin, 341<sup>st</sup> CES at Malmstrom Air Force Base. April 15, 2003.
- Montana Historical Society. 2003. Montana Timeline.  
<http://www.his.state.mt.us/departments/education/>. Helena.
- Montana NHP 2003. Montana Natural Heritage Program. 2003. Online Database at <http://nhp.nris.state.mt.us>.
- SCS 1982. Soil Survey of Cascade County Area, Montana. U.S. Department of Agriculture. Soil Conservation Service. U.S. Government Printing Office. Washington, D.C. 1982.
- Stordahl 2003. Personal communication with James Stordahl, Construction Representative, U.S. Army Corps of Engineers, Malmstrom AFB Project Office. April 15, 2003.
- U.S. Census 2000. Census 2000 State and County QuickFacts. New Jersey, Burlington County. U.S. Census Bureau. 2000.
- USAF 1994a. AICUZ Study, A Citizen's Brochure. United States Air Force, Malmstrom AFB, Montana. 1994.

- 1994b. Endangered Species Biological Survey of Malmstrom Air Force Base. Prepared for United States Air Force by BioSystems Analysis, Inc. December 1994.
- 1995a. Air Force Family Housing Guide for Planning, Programming, Design and Construction. Prepared by Headquarters United States Air Force Office of The Civil Engineer Directorate of Housing and The Air Force Center for Environmental Excellence Construction Management Directorate. December 1995.
1998. Environmental Assessment of the Proposed Creation of a Rapid Engineer, Deployable, Heavy Operational Radar Squadron, Engineer (RED HORSE) training area at Malmstrom AFB. Prepared by 341 CES/CEVV, Malmstrom AFB. Referenced in the Environmental Assessment for Proposed Land Outgrant, Malmstrom AFB, prepared by Tetrattech, 2000.
1999. Environmental Assessment. Acquisition of and Improvements to 10th Avenue North Near Malmstrom Air Force Base. Prepared by 341/CES/CEVC. Referenced in Draft Environmental Assessment, 18th Avenue North Construction Defense Access Road Project – DAR 98-3003A, Malmstrom AFB, Great Falls, Montana, 5/15/2001.
2000. Environmental Assessment for Proposed Land Outgrant, Malmstrom AFB, prepared by Tetrattech, 2000.
- 2001b. Final Integrated Natural Resources Management Plan, Malmstrom Air Force Base. 341 CES/CEV Malmstrom Air Force Base, Montana. December 2001.
2003. FY 2004 Military Construction Project Data, Malmstrom Air Force Base, Replace Family Housing (PH IV). DD Form 1391. Undated. Received from 341<sup>st</sup> CES/CEV on April 15, 2003.
- USEPA 1973. Legal Compilation on Noise, Volume 1, Page 2-104. 1973.
1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Publication 550/9-74-004. Office of Noise Abatement and Control, Washington, D.C. March.
- USFS 2000. U.S. Forest Service Region 1 Eastside National Forest Air Quality Assessment. Prepared by Mark T. Story, Gallatin National Forest, 2/15/2000. Downloaded from the Internet on 4/30/2003, <http://www.fs.fed.us/r1/gallatin/resources/air/reports/EastsideAQAssessment.pdf>.
- Wetlands West 2000. Draft Biological Resources Report, NE Bypass-Great Falls. Prepared for Montana department of Transportation and Thomas, Dean & Hoskins, Inc. Project No. NH5205(14). January 2000.

AFSPC needs to answer this for us. Looks like they want more specifics.

Col Smie

-----Original Message-----

From: AF/A7CH Workflow  
Sent: Wednesday, March 22, 2006 11:25 AM  
To: Smietana Michael Col AF/A7CH  
Cc: Moore Robert Civ AF/A7CH; Branosky Joel Ctr AF/A7CHM  
Subject: FW: Malmstrom Storm Drainage - OSD info request

SAF/IE didn't like response. Is housing a major factor in driving development and causing water runoff damage to property? Will probably get another short suspense...Ken

-----Original Message-----

From: Serrano Marriane Civ SAF/IE  
Sent: Wednesday, March 22, 2006 11:18 AM  
To: AF/A7C Congressional Workflow  
Cc: AF/A7CC Workflow; AF/A7CH Workflow  
Subject: RE: Malmstrom Storm Drainage - OSD info request

This is the same BBP that was sent out earlier that prompted the two questions:

What is the reason for the increased development at Malmstrom (i.e. realignment, mission change, privatization, moderization,...)?

What are the specific A7C efforts to reduce the volume of stormwater that is causing the ranchers/farmers to lose their property?

-----Original Message-----

From: Willingham Donna Civ AF/A7CPP On Behalf Of AF/A7C Congressional Workflow  
Sent: Wednesday, March 22, 2006 10:53 AM  
To: Serrano Marriane Civ SAF/IE  
Cc: AF/A7C Congressional Workflow; AF/A7CC Workflow; AF/A7CH Workflow  
Subject: RE: Malmstrom Storm Drainage - OSD info request

Attached is the A7C approved reply.

DONNA L. WILLINGHAM  
A7C Congressional Affairs Program Manager  
Plans and Policy Branch  
DSN 664-3624  
(703)604-3624  
donna.willingham@pentagon.af.mil

-----Original Message-----

From: Serrano Marriane Civ SAF/IE  
Sent: Friday, March 17, 2006 9:15 AM  
To: AF/A7C Congressional Workflow  
Cc: Willingham Donna Civ AF/A7CPP  
Subject: Malmstrom Storm Drainage - OSD info request  
Importance: High

Apologize for such short notice, I understand OSD is requesting for more details on the Malmstrom Storm Drainage (pls see specifics below) and would like answers today.

-----Original Message-----

From: Morganti Joseph Col SAF/IEI  
Sent: Friday, March 17, 2006 6:17 AM

## Hodges, James E Civ 341 CES CEV

---

**From:** Barrish, Robert A Civ AFSPC/A7CV  
**Sent:** Wednesday, 22 March 2006 12:38 PM  
**To:** Hodges, James E Civ 341 CES CEV  
**Cc:** Clavin, Karen J Civ 341 CES CEVC  
**Subject:** FW: Malmstrom Storm Drainage - OSD info request

-----Original Message-----

**From:** Rogers, Stanley E GS-13 AFSPC/A7CVP  
**Sent:** Wednesday, March 22, 2006 12:18 PM  
**To:** Barrish, Robert A Civ AFSPC/A7CV  
**Subject:** FW: Malmstrom Storm Drainage - OSD info request

FYI/A. Let's get together after lunch to discuss.

Stan

-----Original Message-----

**From:** Maher, Gary T GS-15 AFSPC/A7CP  
**Sent:** Wednesday, March 22, 2006 10:19 AM  
**To:** Rogers, Stanley E GS-13 AFSPC/A7CVP



Malmstrom AFB  
Stormwater BBP.d...

**Subject:** Fw: Malmstrom Storm Drainage - OSD info request

Stan, pls work this. Touch base with michelle. A7cv remains opr for this. Mr maher

-----  
Sent from my BlackBerry Wireless Handheld

-----Original Message-----

**From:** Moore Robert Civ AF/A7CH  
**To:** Linn, Michelle A GS-15 AFSPC/A7CH  
**CC:** Maher, Gary T GS-15 AFSPC/A7CP; Branosky Joel Ctr AF/A7CHM; Smietana Michael Col AF/A7CH  
**Sent:** Wed Mar 22 10:06:37 2006  
**Subject:** FW: Malmstrom Storm Drainage - OSD info request

Michelle, we tried to answer this question but got more from OSD ...

- \* What is the reason for the increased development at Malmstrom (i.e. realignment, mission change, privatization, modernization,...)?
- \* What are the specific AF efforts to reduce the volume of stormwater that is causing the ranchers/farmers to lose their property?

Attached is what we sent OSD in response to Congressional questions during testimony. Feel free to edit and return. If it's not housing we need to get the answers from the appropriate program managers. Cheers, Bob

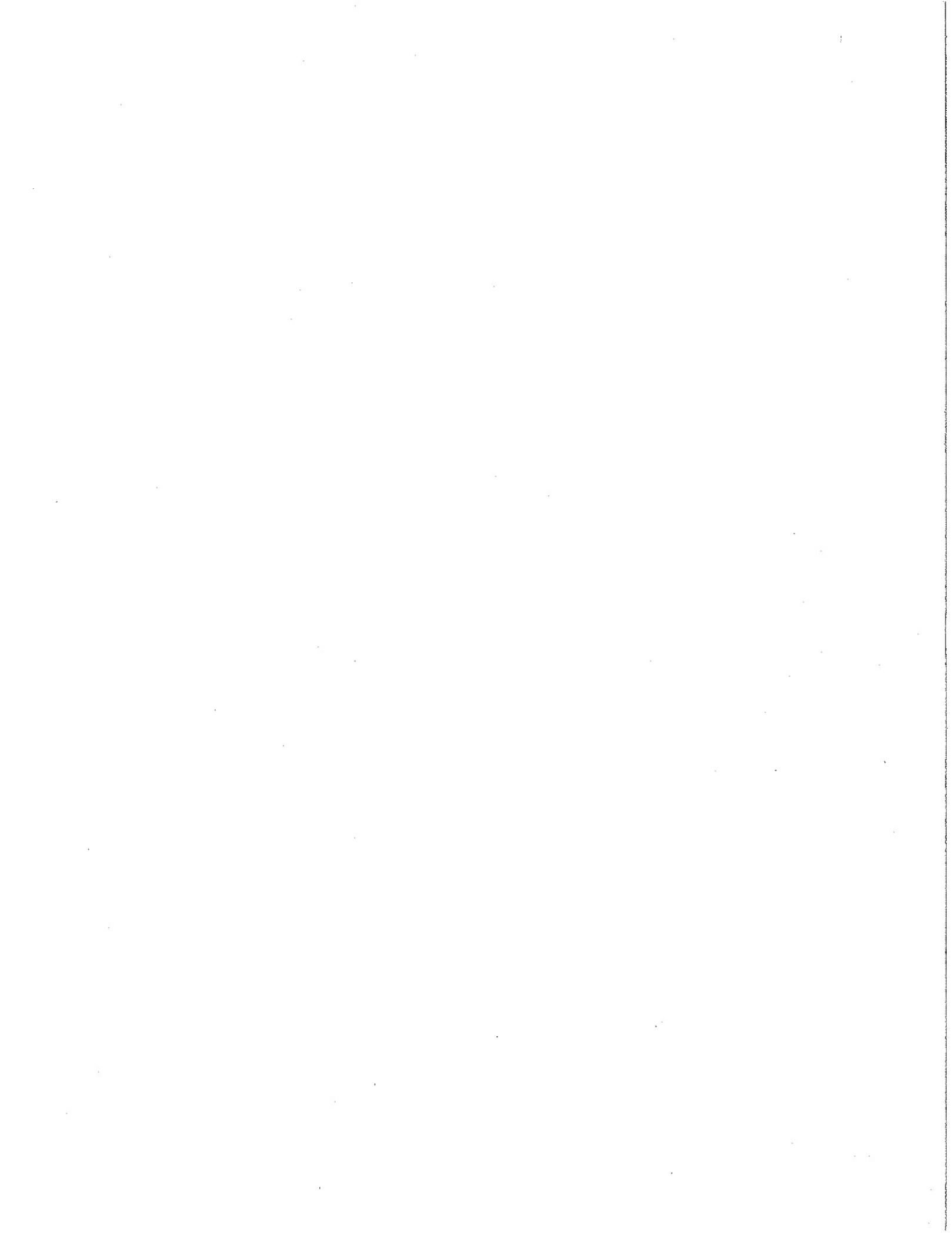
-----Original Message-----

**From:** Smietana Michael Col AF/A7CH  
**Sent:** Wednesday, March 22, 2006 11:31 AM  
**To:** AF/A7CH Workflow  
**Cc:** Moore Robert Civ AF/A7CH; Branosky Joel Ctr AF/A7CHM  
**Subject:** RE: Malmstrom Storm Drainage - OSD info request

## PHASE V FAMILY HOUSING PROJECT

These housing units were donated to the following local Indian tribes for use through the Walking Shield Program:

- Fort Belknap received 22 housing units (11 duplexes) and 15 garages.
- Northern Cheyenne received 27 housing units (13.5 duplexes) and 14 garages.
- Rocky Boy received 131 housing units (65.5 duplexes) and 67 garages. (Information provided from Cindy O'Connel at Malmstrom at 406-731-6209)
- 90 storage sheds were also removed and either relocated or disposed of, based on condition (D. Geertz, Pers. Comm.. April, 2004).





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 341ST SPACE WING (AFSPC)

file 33Bm

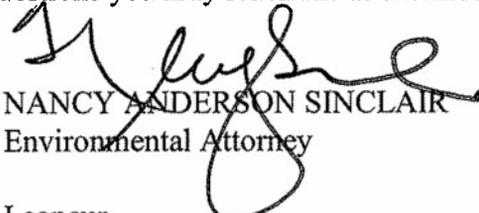
19 July 2004

MEMORANDUM FOR 341 CES/CEV

FROM: 341 SW/JA

SUBJECT: Legal Review – FONSI for Proposed Phase V/FY05 Housing Project

1. I have reviewed the draft Environmental Assessment (EA) done for the Phase V/FY05 Housing Replacement project and find it legally sufficient. The EA is ready for the public notice and an opportunity to comment.
2. The National Environmental Policy Act (NEPA) at 42 U.S.C. §4321 et seq. requires that any proposed federal action that may impact the environment must be analyzed for the type and extent of impact of the proposed action on the environment. The analysis must employ, “a systematic, interdisciplinary approach to ensure the integrated use of the natural and social sciences, and the environmental design arts in planning and decision making, where federal actions may have an impact on the environment.” See NEPA §102. The Air Force has implemented this policy through a multi-tiered process, with the first tier being the completion of an EA, which will be used to decide if further study in the form of an Environmental Impact Statement (EIS) must be prepared. However, prior to finalization of the EA the public must be given notice of the pending project and the opportunity to comment.
3. The draft EA prepared for the Phase V/FY05 Housing Project employed the interdisciplinary approach and spoke to all functional areas of environmental law providing a comprehensive environmental review. The EA found no significant impacts; however the public must be given notice and an opportunity to comment. If any comments are received they will be addressed and incorporated into the EA. If there are no significant impacts resulting from the construction project a Finding of No Significant Impact (FONSI) may be signed.
4. The draft EA is legally sufficient, and the public should be notified and given the opportunity to comment. Once any comments are received please return the completed EA and FONSI if appropriate for final legal review. If you have any questions you may reach me at extension 2878.

  
NANCY ANDERSON SINCLAIR  
Environmental Attorney

I concur.

  
THOMAS J. COUTURE, Lt Col, USAF  
Staff Judge Advocate

