

*Final*

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AAFES SHOPPING CENTER  
ENVIRONMENTAL ASSESSMENT

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*Prepared for*  
**Malmstrom AFB, Montana**  
*and*  
**Army and Air Force Exchange Service**

**August 2009**

## Report Documentation Page

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## ACRONYMS AND ABBREVIATIONS

AAFES	Army and Air Force Exchange Service	MNHP	Montana Natural Heritage Program
AFB	Air Force Base	$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
Air Force	United States Air Force	MPDES	Montana Pollutant Discharge Elimination System
AFI	Air Force Instruction	MW	Missile Wing
AFSPC	Air Force Space Command	NAAQS	National Ambient Air Quality Standards
ALSC	ALSC Architects	NAS	Naval Air Station
AQCR	Air Quality Control Region	NEPA	National Environmental Policy Act
AQRV	Air Quality Related Value	$\text{NO}_2$	Nitrogen Dioxide
BRAC	Base Realignment and Closure	$\text{NO}_x$	Nitrogen Oxide
CAA	Clean Air Act	NOV	Notice of Violation
CAAA	Clean Air Act Amendments	NPDES	National Pollutant Discharge Elimination System
CEQ	Council on Environmental Quality	NPS	National Park Service
CF	Cubic Foot/Feet	NRHP	National Register of Historic Places
CFR	Code of Federal Regulations	NSR	New Source Review
cfs	cubic feet/second	NTL	NTL Engineering
CO	Carbon Monoxide	$\text{O}_3$	Ozone
CWA	Clean Water Act	Pb	Lead
dB	decibel	$\text{PM}_{2.5}$	Particulate Matter less than 2.5 Microns
DoD	Department of Defense	$\text{PM}_{10}$	Particulate Matter less than 10 Microns
DEQ	Department of Environmental Quality	ppm	parts per million
EA	Environmental Assessment	PSD	Prevention of Significant Deterioration
EIAP	Environmental Impact Analysis Process	Q/D	Quality/Distance
EIS	Environmental Impact Statement	RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron
ESA	Endangered Species Act	SCS	Soil Conservation Service
FICON	Federal Interagency Committee on Noise	SF	Square Foot/Feet
FONSI	Finding of No Significant Impact	SHPO	State Historic Preservation Office
HAPs	Hazardous Air Pollutants	SIP	State Implementation Plan
$\text{H}_2\text{S}$	Hydrogen Sulfide	$\text{SO}_2$	Sulfur Dioxide
HWMP	Hazardous Waste Management Plan	SMW	Strategic Missile Wing
ICBM	Intercontinental Ballistic Missile	SW	Space Wing
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	UFC	Unified Facilities Criteria
I	Interstate	U.S.	United States
IRP	Installation Restoration Program	USACE	United States Army Corps of Engineers
km	Kilometer	USC	United States Code
LEED	Leadership in Energy & Environmental Design	USCB	United States Census Bureau
LF	Launch Facility	USEPA	United States Environmental Protection Agency
LID	Low Impact Design	USFS	United States Forest Service
MAF	Missile Alert Facility	USFWS	United States Fish and Wildlife Service
MDFWP	Montana Department of Fish, Wildlife and Parks	UST	Underground Storage Tank
		VOCs	Volatile Organic Compounds

**FINAL**  
**FINDING OF NO SIGNIFICANT IMPACT**

**1.0 NAME OF THE PROPOSED ACTION**

Army and Air Force Exchange Service (AAFES) Shopping Center

**2.0 DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

AAFES proposes to construct a Shopping Center on Malmstrom Air Force Base (AFB). The 40,300-square foot Shopping Center would include a main exchange, a Shoppette/Class VI store, a Charley's Steakery, and three retail concessions. In addition, the Shopping Center would feature four multi-product gasoline dispensers with a canopy roofing system and up to 160 customer parking spaces. The proposed action would consolidate the services found in two, geographically separated facilities (i.e., Base Exchange and gas station) to a single location on the base. In addition to the proposed action, the no-action alternative is also analyzed. Under the no-action alternative, AAFES would not construct a new Shopping Center on Malmstrom AFB at this time.

**3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

The Environmental Assessment (EA) provides an analysis of the potential environmental consequences resulting from implementation of the proposed action. Seven resource categories were thoroughly analyzed to identify potential impacts. According to the analysis in this EA, implementation of the proposed action or no-action alternative would not result in significant impacts to any resource category. The potential impacts under the proposed action and the no-action alternative are summarized below.

***Air Quality.*** Impacts to air quality associated with construction activities would be short-term and contribute less than 0.1 percent to the regional air emissions, thereby not resulting in any adverse or significant impacts to regional air quality. Under the no-action alternative, impacts to air quality would not be expected since baseline emissions would remain unchanged; therefore, implementing the no-action alternative would not result in adverse effects to the regional air quality.

***Soils and Water Resources.*** No long-term adverse impacts to soils or surface water would occur; most impacts would be short-term resulting in negligible effects. Groundwater sources would not be affected from construction activities associated with the proposed action and no wetlands were found at or near the proposed project site. The amount of impervious surface at Malmstrom AFB would increase by approximately 4.4 acres in Drainage Area 2 with construction of the AAFES Shopping Center; however, a series of stormwater basins would provide on-site water filtration and retention that would reduce stormwater runoff to negligible levels. Under the no-action alternative, the Shopping Center would not be constructed on Malmstrom AFB at this time; therefore, impacts to these resources beyond baseline conditions would not be expected.

***Biological Resources.*** No long-term impacts to vegetation or wildlife would be expected. No threatened, endangered, or sensitive species are known to occur on Malmstrom AFB; therefore, these resources would not be subjected to adverse impacts under the proposed action. Under the no-action alternative, no

changes to existing biological resources would occur since the AAFES construction proposal would not take place.

**Cultural Resources.** No architectural, archaeological, or traditional resources are found at the site proposed for construction; therefore, no impact to these resources would be anticipated. Under the no-action alternative, ground disturbance would not occur since the proposed AAFES Shopping Center would not be constructed on Malmstrom AFB; no changes to the existing conditions of cultural resources would occur as a result of the no-action alternative.

**Socioeconomics.** A short-term, positive input into the regional economy would occur during the 17-month construction period. No changes would be anticipated with implementation of the no-action alternative.

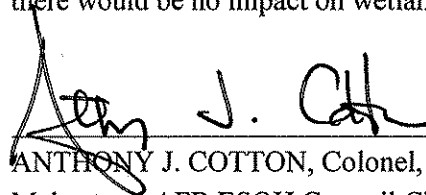
**Land Management and Use.** A waiver would be needed prior to construction to change the land use designation from Open Space to Community Commercial; no impacts from implementing this change would be anticipated. No impacts or change to the land use designation would occur under the no-action alternative.

**Hazardous Materials and Waste Management.** No changes to hazardous materials or waste streams would occur. No Installation Restoration Program sites would be disturbed as none are found in the project area. No impacts to the handling of hazardous materials or waste management would occur through implementation of the no-action alternative since the AAFES Shopping Center would not be constructed.

#### 4.0 FINDINGS

On the basis of the findings of the EA, conducted in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code 4321 *et seq.*), Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] Part 1500-1508), and Air Force Instruction 32-7061, *The Environmental Impact Analysis Process*, as codified in 32 CFR Part 989, and after careful review of the potential impacts of the proposed action and no-action alternative, I find that there would be no significant impact on the quality of the human or natural environment from the implementation of the proposed action or no-action alternative described in the EA. Therefore, I find there is no requirement to develop an Environmental Impact Statement.

In accordance with Executive Order 11990, *Protection of Wetlands* authority delegated in the Secretary of the Air Force Order 791.1, and the written redelegations accomplished pursuant to the order, I find that there would be no impact on wetland environments from this construction.

  
\_\_\_\_\_  
ANTHONY J. COTTON, Colonel, USAF  
Malmstrom AFB ESOH Council Chairman

7 Aug 09  
\_\_\_\_\_  
Date

**COVER SHEET  
AAFES SHOPPING CENTER  
ENVIRONMENTAL ASSESSMENT**

**Responsible Agency:** Army and Air Force Exchange Service (AAFES)

**Proposed Action:** The Army and Air Force Exchange Service (AAFES) proposes to construct a new Shopping Center at Malmstrom Air Force Base (AFB), Montana. The AAFES Shopping Center would include a main exchange, a Shoppette/Class VI store, a Charley's Steakery, and three retail concessions. In addition, the Shopping Center would feature four multi-product gasoline dispensers with a canopy roofing system and up to 160 customer parking spaces.

Written comments and inquiries regarding this document should be directed to:

341 CES/CEAOP  
39 78<sup>th</sup> Street North  
Malmstrom AFB, Montana 59402-7536  
ATTN: Christopher Murphy

**Designation:** Final Environmental Assessment

**Abstract:** The purpose of the proposed action is to construct a new 40,300-square foot Shopping Center on Malmstrom AFB. The new AAFES Shopping Center would combine the services found in the existing Base Exchange (Building 1150) and gas station (Building 685). Both of these buildings are outdated and they can no longer meet the needs of the Malmstrom AFB active duty and retired personnel and their dependents. Construction of the new 40,300-square foot AAFES Shopping Center would provide Malmstrom AFB with modern exchange facilities with a variety of merchandise and services. This EA analyzed the potential environmental consequences of implementing the proposed action or no-action alternative. The analysis indicates that implementing either the proposed action (i.e., construct an AAFES Shopping Center) or no-action alternative at Malmstrom AFB would not result in a significant impact to any resource category. In addition, no significant cumulative impacts would be anticipated from implementation of the proposal with other reasonably foreseeable actions.

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AAFES SHOPPING CENTER  
ENVIRONMENTAL ASSESSMENT

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**August 2009**



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# **EXECUTIVE SUMMARY**

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## **EXECUTIVE SUMMARY**

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This Environmental Assessment (EA) analyzes the potential environmental consequences resulting from the Army and Air Force Exchange Service (AAFES) proposal to construct a new Shopping Center (i.e., Base Exchange and gas station) on Malmstrom Air Force Base (AFB). The proposed action would consolidate the services found in two, geographically separated facilities to a single location on the base.

This EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq.*), Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process* (EIAP), as codified in 32 CFR Part 989.

### **PURPOSE AND NEED FOR THE AAFES SHOPPING CENTER**

The existing Base Exchange was constructed in 1957 and the building suffers from dated design features that limit retail merchandising opportunities. The flooring and carpet are dated and worn; the lighting and suspended ceiling tiles are not up to the current AAFES decor and finish standards. The gas station was built in 1974 and it no longer has sufficient space for retail merchandise, the concrete slab is cracked, and the installed equipment is irreparable. In addition, these two facilities are geographically separated on the base. To improve the quality of basic shopping services for Malmstrom AFB military members and their dependents, the base needs a contemporary shopping center. Constructing a modern one-stop shopping center would enhance the quality of life thus improving the morale and welfare of Malmstrom AFB active duty and retired personnel and their dependents.

### **PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

Under the proposed action, AAFES would construct a new 40,300-square foot Shopping Center adjacent to the Commissary. The Shopping Center would include a retail store, a Shoppette/Class VI store, a Charley's Steakery, and three concessions in addition to four multi-product gasoline dispensers with an overhead canopy roofing system. Parking would include 160 customer parking spaces with an additional 30 parking spaces for employees located at the rear of the building. Access to the Shopping Center would include two two-way driveways; one each on 72<sup>nd</sup> Street North and 73<sup>rd</sup> Street North. The rear of the building would be accessible for deliveries and employee parking via the existing driveway of the Commissary loading dock area. AAFES anticipates that construction of the Shopping Center would begin in fiscal year 2009 and require approximately 17 months to complete.

The no-action alternative represents baseline conditions. Under the no-action alternative, the AAFES Shopping Center proposal would not be implemented and the services provided by the existing Base

Exchange and gas station would continue. This alternative would not meet the future needs of the military members of Malmstrom AFB, their dependents, or retirees that require the use of these services.

## **MITIGATION MEASURES**

In accordance with 32 CFR Part 989.22, the Air Force must indicate if any mitigation measures would be needed to implement the proposed action at Malmstrom AFB. No mitigation measures will be needed to arrive at a finding of no significant impact if the proposed action were selected for implementation at Malmstrom AFB.

## **SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**

According to the analysis in this EA, implementation of the proposed action would not result in long-term adverse or significant impacts to any resource category. The potential environmental impacts under the proposed action and the no-action alternative are summarized below.

***Air Quality.*** Impacts to air quality associated with construction activities would be short-term and contribute less than 0.1 percent to the regional air emissions, thereby not resulting in any adverse or significant impacts to regional air quality. Under the no-action alternative, impacts to air quality would not be expected since baseline emissions would remain unchanged; therefore, implementing the no-action alternative would not result in adverse effects to the regional air quality.

***Soils and Water Resources.*** No long-term adverse impacts to soils or surface water would occur; most impacts would be short-term resulting in negligible effects. Groundwater sources would not be affected from construction activities associated with the proposed action and no wetlands were found at or near the proposed project site. The amount of impervious surface at Malmstrom AFB would increase by approximately 4.4 acres in Drainage Area 2 with construction of the AAFES Shopping Center; however, a series of stormwater basins would provide on-site water filtration and retention that would reduce stormwater runoff to negligible levels. Under the no-action alternative, the Shopping Center would not be constructed on Malmstrom AFB at this time; therefore, impacts to these resources beyond baseline conditions would not be expected.

***Biological Resources.*** No long-term impacts to vegetation or wildlife would be expected. No threatened, endangered, or sensitive species are known to occur on Malmstrom AFB; therefore, these resources would not be subjected to adverse impacts under the proposed action. Under the no-action alternative, no changes to existing biological resources would occur since the AAFES construction proposal would not take place.

***Cultural Resources.*** No architectural, archaeological, or traditional resources are found at the site proposed for construction; therefore, no impact to these resources would be anticipated. Under the no-action alternative, ground disturbance would not occur since the proposed AAFES Shopping Center would not be constructed on Malmstrom AFB; no changes to the existing conditions of cultural resources would occur as a result of the no-action alternative.

***Socioeconomics.*** A short-term, positive input into the regional economy would occur during the 17-month construction period. No changes would be anticipated with implementation of the no-action alternative.

***Land Management and Use.*** A waiver would be needed prior to construction to change the land use designation from Open Space to Community Commercial; no impacts from implementing this change would be anticipated. No impacts or change to the land use designation would occur under the no-action alternative.

***Hazardous Materials and Waste Management.*** No changes to hazardous materials or waste streams would occur. No Installation Restoration Program sites would be disturbed as none are found in the project area. No impacts to the handling of hazardous materials or waste management would occur through implementation of the no-action alternative since the AAFES Shopping Center would not be constructed.

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# **TABLE OF CONTENTS**

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# TABLE OF CONTENTS

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## FINDING OF NO SIGNIFICANT IMPACT

<b>EXECUTIVE SUMMARY .....</b>	<b>ES-1</b>
<b>1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION .....</b>	<b>1-1</b>
1.1 Introduction .....	1-1
1.2 Background .....	1-1
1.3 Purpose and Need for the Proposed Action.....	1-3
<b>2.0 DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION</b>	
<b>ALTERNATIVE.....</b>	<b>2-1</b>
2.1 Proposed Action .....	2-1
2.2 No-Action Alternative .....	2-4
2.3 Environmental Impact Analysis Process .....	2-4
2.4 Other Regulatory and Permit Requirements.....	2-5
2.5 Mitigation Measures .....	2-5
2.6 Summary of Impacts .....	2-5
<b>3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND</b>	
<b>ENVIRONMENTAL CONSEQUENCES.....</b>	<b>3-1</b>
3.1 Analysis Approach .....	3-1
3.2 Air Quality.....	3-4
3.2.1 Affected Environment .....	3-7
3.2.2 Environmental Consequences.....	3-8
3.3 Soils and Water Resources .....	3-11
3.3.1 Affected Environment .....	3-11
3.3.2 Environmental Consequences .....	3-18
3.4 Biological Resources .....	3-21
3.4.1 Affected Environment .....	3-21
3.4.2 Environmental Consequences .....	3-22
3.5 Cultural Resources .....	3-23
3.5.1 Affected Environment .....	3-24
3.5.2 Environmental Consequences .....	3-24
3.6 Socioeconomics.....	3-25
3.6.1 Affected Environment .....	3-25
3.6.2 Environmental Consequences .....	3-26
3.7 Land Management and Use.....	3-26
3.7.1 Affected Environment .....	3-27
3.7.2 Environmental Consequences .....	3-27
3.8 Hazardous Materials and Waste Management .....	3-29
3.8.1 Affected Environment .....	3-29
3.8.2 Environmental Consequences .....	3-30

<b>4.0</b>	<b>CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES .....</b>	<b>4-1</b>
4.1	Cumulative Effects .....	4-1
4.2	Scope of Cumulative Effects Analysis .....	4-1
4.2.1	Past, Present, and Future Actions .....	4-2
4.2.2	Analysis of Cumulative Impacts .....	4-2
4.3	Irreversible and Irretrievable Commitment of Resources .....	4-4
<b>5.0</b>	<b>REFERENCES CITED .....</b>	<b>5-1</b>
<b>6.0</b>	<b>PERSONS AND AGENCIES CONTACTED.....</b>	<b>6-1</b>
<b>7.0</b>	<b>LIST OF PREPARERS AND CONTRIBUTORS .....</b>	<b>7-1</b>
<b>APPENDIX A</b>	<b>INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING CORRESPONDENCE.....</b>	<b>A-1</b>
<b>APPENDIX B</b>	<b>AIR QUALITY ANALYSIS.....</b>	<b>B-1</b>

**LIST OF FIGURES**

1.1	Regional Location .....	1-2
1.2	Proposed Site for AAFES Shopping Center on Malmstrom AFB .....	1-4
2.1	Proposed Site Plan for the AAFES Shopping Center .....	2-2
3.1	Soil Types found on Malmstrom AFB.....	3-13
3.2	Stormwater Flow from Malmstrom AFB .....	3-15
3.3	Drainage Areas and Stormwater Outfalls on Malmstrom AFB .....	3-16
3.4	Location of Wetlands on Malmstrom AFB .....	3-17
3.5	Existing Malmstrom AFB Land Use Designations.....	3-28
3.6	Location of IRP Sites on Malmstrom AFB.....	3-31

**LIST OF TABLES**

3.1	Resources Analyzed in the Environmental Impact Analysis Process .....	3-2
3.2	Montana and National Ambient Air Quality Standards.....	3-5
3.3	Projected Emissions from Implementation of the Proposed Action (tons/year).....	3-9

# **CHAPTER 1**

## **PURPOSE AND NEED FOR THE PROPOSED ACTION**

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# CHAPTER 1

## PURPOSE AND NEED FOR THE PROPOSED ACTION

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### 1.1 INTRODUCTION

The Army and Air Force Exchange Service (AAFES) proposes to construct a new Shopping Center at Malmstrom Air Force Base (AFB), Montana. The Shopping Center would feature retail and food concessions, four gasoline pumps, and customer and employee parking. The Shopping Center would consolidate the services found in two, geographically separated facilities to a single location on the base.

This environmental assessment (EA) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq.*), Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process* (EIAP), as codified in 32 CFR Part 989. This EA analyzes the potential environmental consequences of implementing the proposed action and no-action alternative. Under the no-action alternative, AAFES would not construct a new Shopping Center on Malmstrom AFB at this time. No other alternatives were considered as none would meet the overall purpose and need.

### 1.2 BACKGROUND

Malmstrom AFB is located about one mile east of the city of Great Falls and about 75 miles east of the Rocky Mountains in north central Montana (Figure 1.1). Access to the base can be made through one of the two access gates. The main gate entrance is off United States (U.S.) Highway 87/89, east of Interstate 15 (I-15), via 2<sup>nd</sup> Avenue North. Entry can also be made via 10<sup>th</sup> Avenue North off of 57<sup>th</sup> Street Bypass.

Malmstrom AFB encompasses approximately 3,600 acres of government-owned land in Cascade County. The base was established on July 6, 1942 as Great Falls Army Air Base. In 1955, its name was changed to Malmstrom AFB in honor of Colonel Einar Axel Malmstrom. In 1961, the 341<sup>st</sup> Strategic Missile Wing (341 SMW) was activated as the Air Force's first Minuteman Intercontinental Ballistic Missile (ICBM) wing. The 341 SMW was redesignated the 341 Missile Wing (MW) in 1991. In 1994, the 341 MW was reassigned to Air Force Space Command (AFSPC) and in 1997 was designated as the 341 Space Wing (SW). The 341 SW was redesignated 341 MW in 2008. The 341 MW at Malmstrom AFB is currently one of three Air Force units with responsibility for maintenance and operation of the Minuteman III ICBM. This includes 150 Minuteman III missiles and 15 missile alert facilities at various locations throughout north central Montana. In August 1997, Malmstrom AFB became the host to the 819<sup>th</sup> Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer (RED HORSE) squadron, a rapidly deployable Air Combat Command engineering and construction unit.

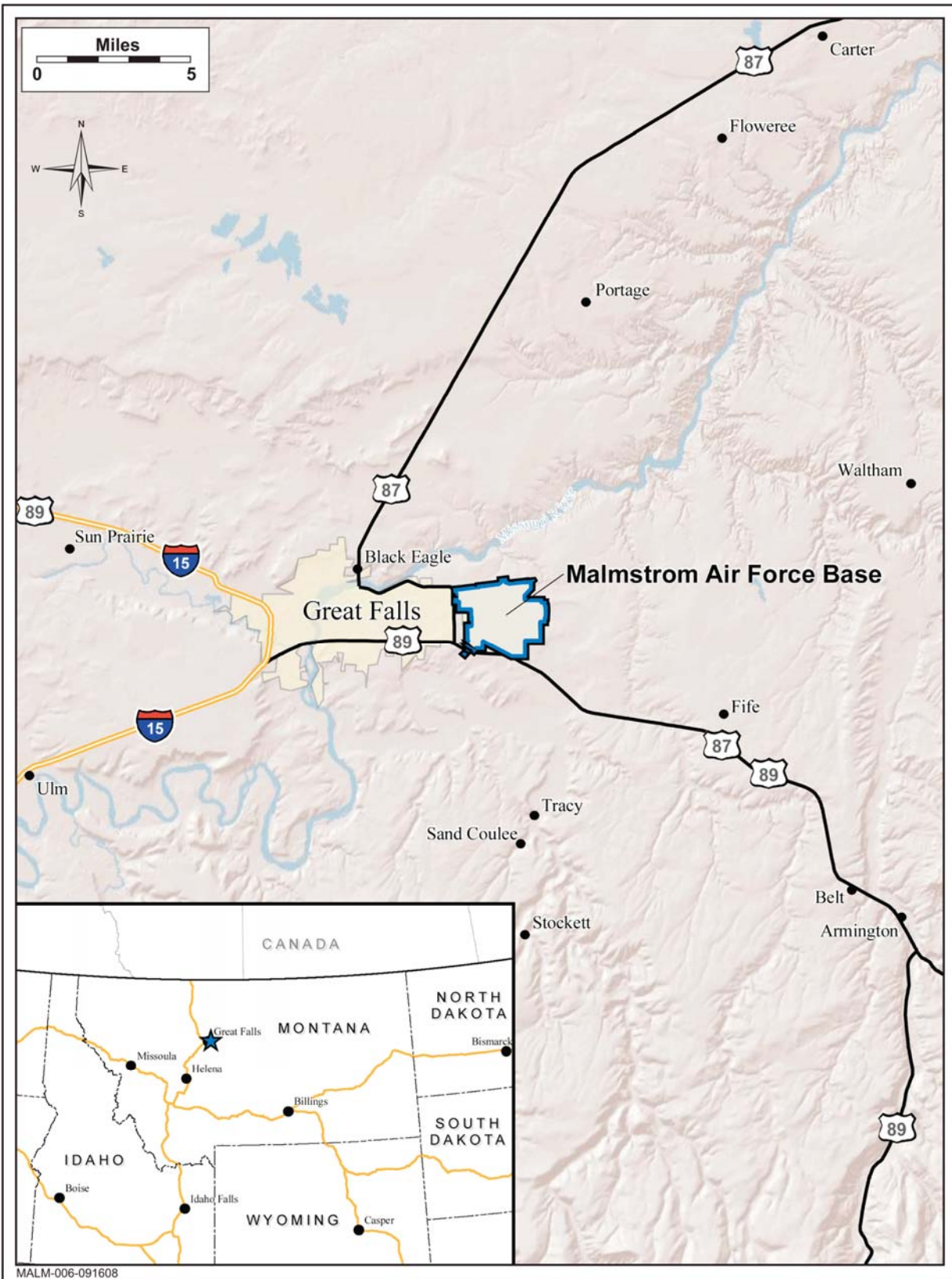


Figure 1.1 Regional Location

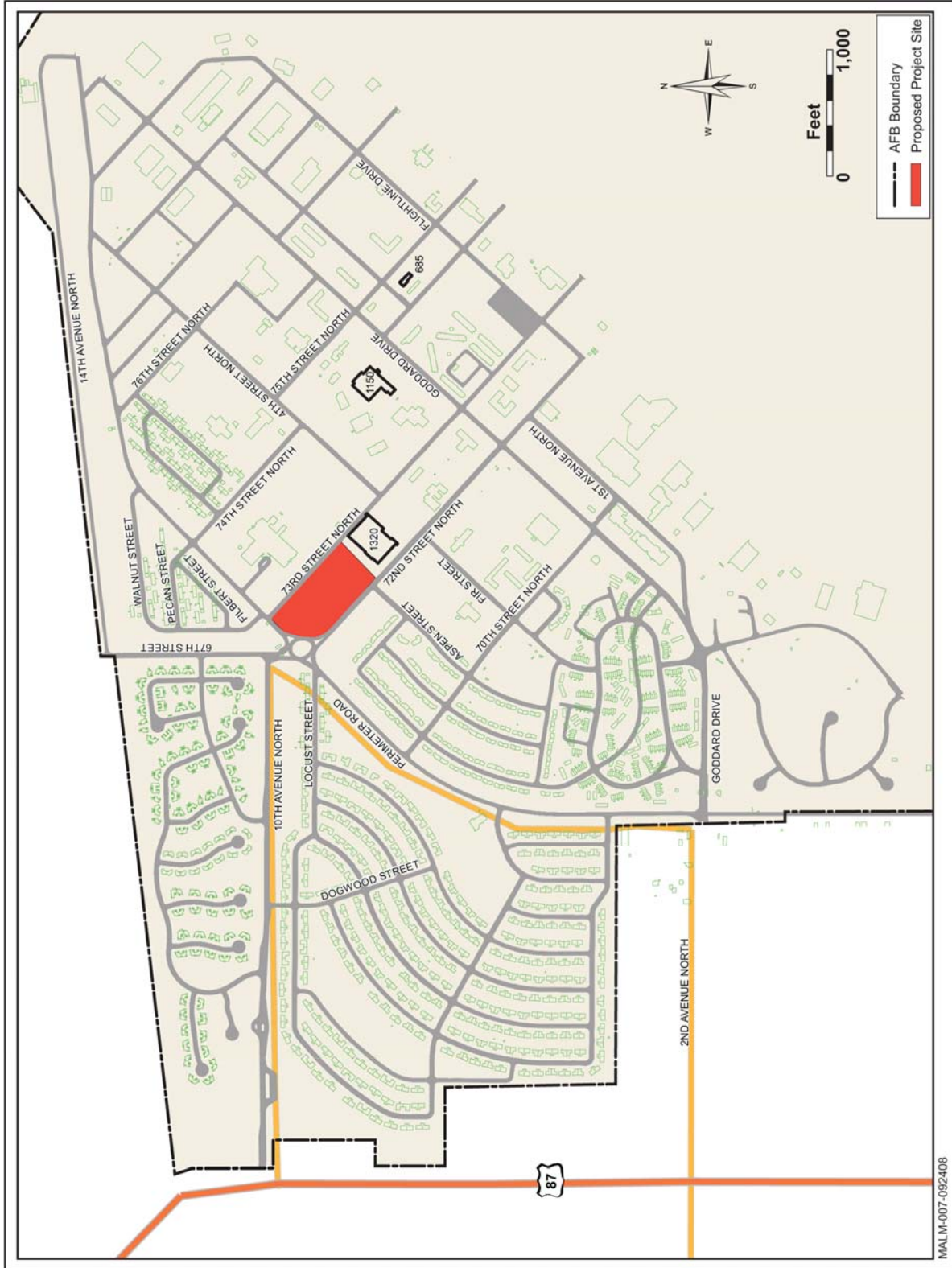
Comprised of 400 personnel that train on-base for rapid deployment in remote high-threat environments around the globe, this unit remains an important component of the base. Malmstrom AFB also hosts the Air Force Office of Special Investigations, Civil Air Patrol, and Defense Reutilization and Marketing Office.

### **1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION**

The purpose of the proposed action is to construct a new AAFES Shopping Center comprised of a Base Exchange and gas station to meet the needs of Air Force personnel, their families, and retired military. The existing Base Exchange (Building 1150) was constructed in 1957 and was most recently renovated in 1996. Despite renovation, the building suffers from dated design features that include numerous walled areas that inhibit customer movement throughout and limit the opportunities for retail merchandising and display. The flooring and carpet are dated and worn and the lighting and suspended ceiling tiles are not up to the current AAFES decor and finish standards. The existing gas station (Building 685) serves as a service station and auto parts store. The building was constructed in 1974 and has had no major renovations. The concrete slab of the building foundation is cracked, the installed equipment is irreparable, and the auto parts store does not possess sufficient retail merchandising space. As shown in Figure 1.2, buildings 1150 and 685 are geographically separated reducing shopping convenience. At present, the Base Exchange and gas station can no longer adequately meet the needs of the base.

Construction of the new 40,300-square foot AAFES Shopping Center would provide Malmstrom AFB with modern exchange facilities to include a variety of merchandise and services. The AAFES Shopping Center would include a main exchange, a Shoppette/Class VI store, a Charley's Steakery, and three retail concessions. In addition, the Shopping Center would feature four multi-product gasoline dispensers with a canopy roofing system and up to 160 customer parking spaces. As shown in Figure 1.2, the site of the proposed Shopping Center would be conveniently located adjacent to the Commissary (Building 1320). The need for the proposed Shopping Center at Malmstrom AFB is to improve the quality of basic shopping services for active duty and retired personnel and their dependents.





**Figure 1.2 Proposed Site for AAFES Shopping Center on Malmstrom AFB**

## **CHAPTER 2**

# **DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

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## CHAPTER 2

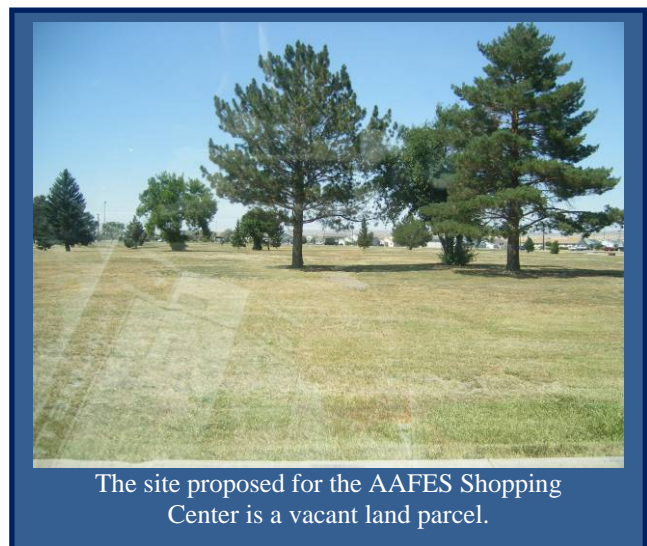
### DESCRIPTION OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE

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This chapter describes the AAFES proposal to construct a new Shopping Center on Malmstrom AFB. The AAFES Shopping Center would consolidate the services found in two separate facilities (i.e., Base Exchange and gas station) to a single location on the base.

#### 2.1 PROPOSED ACTION

The proposed action is to construct a new 40,300-square foot AAFES Shopping Center adjacent to the Base Commissary (Building 1320) as shown in Figure 2.1. The Shopping Center would be located in a vacant land parcel between 72<sup>nd</sup> Street North and 73<sup>rd</sup> Street North at the Perimeter Road traffic spur (refer to Figure 1.2). The Shopping Center would include a retail store, a Shoppette/Class VI store, a Charley's Steakery, and three concessions in addition to four multi-product gasoline dispensers with an overhead canopy roofing system. Parking would include 160 customer parking spaces with an additional 30 parking spaces for employees located at the rear of the building. Access to the Shopping Center would include two two-way driveways; one each on 72<sup>nd</sup> Street North and 73<sup>rd</sup> Street North. The rear of the building would be accessible for deliveries and employee parking via the existing driveway of the Commissary loading dock area.



The shopping center building would be constructed on a ground level, reinforced concrete floor slab with supported steel beams and columns. The roof construction would consist of a metal deck supported on steel joists, beams, and columns. The facility design would be compatible with Malmstrom AFB architectural standards. Additional features would include interior fire detection/protection systems and exterior landscaping. Supporting utility and communication infrastructure would be incorporated into the facility design. Stormwater retention areas (dry basins) would also be constructed to retain stormwater generated from impervious surfaces, such as the building and parking lot.

AAFES anticipates that construction of the Shopping Center would begin in fiscal year 2009 and require approximately 17 months to complete. Commencing with operation of the Shopping Center, AAFES would transfer the existing Base Exchange and gas station to Malmstrom AFB for disposition. Should either of the buildings be demolished, separate environmental documentation would be prepared.

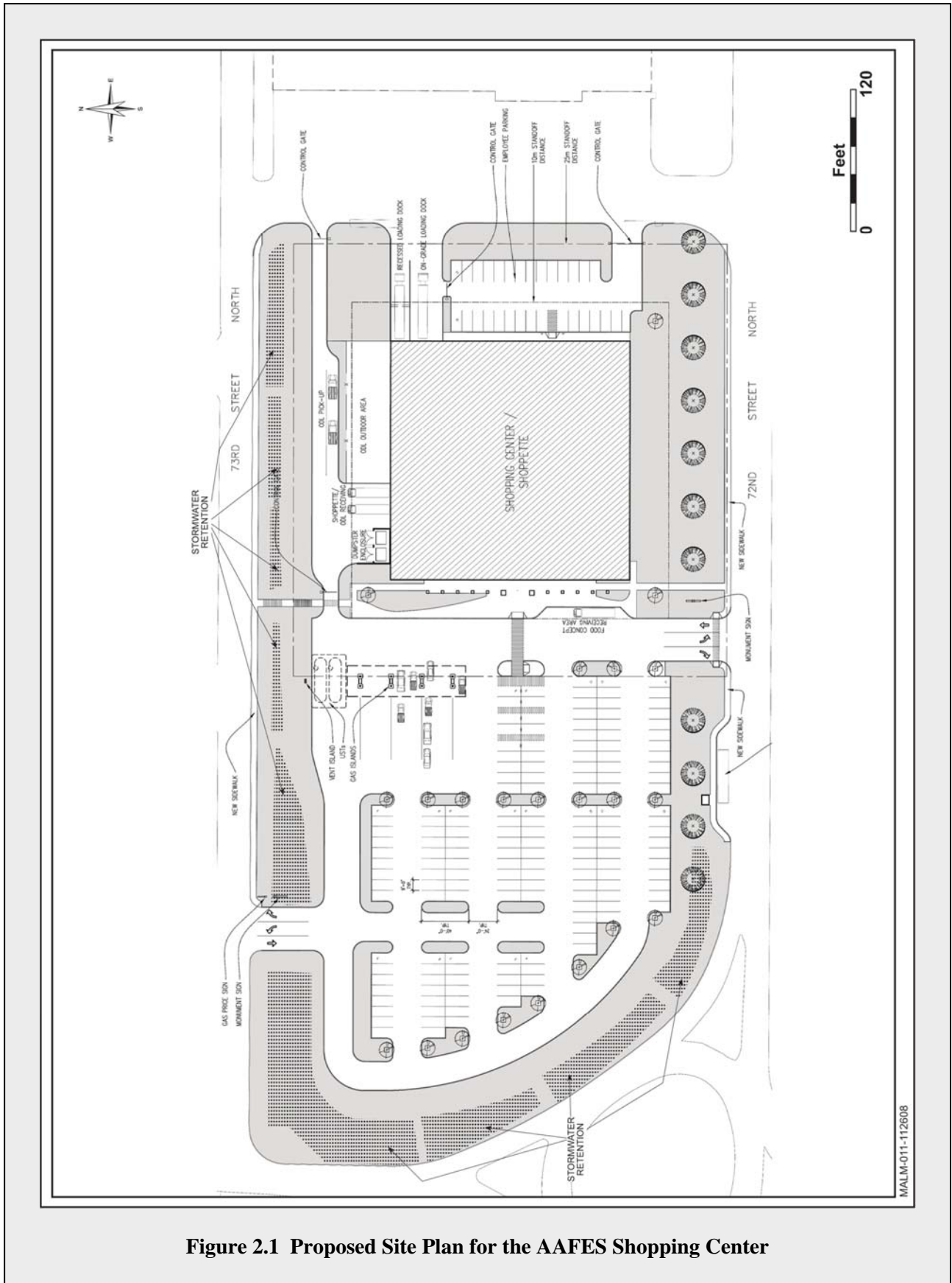


Figure 2.1 Proposed Site Plan for the AAFES Shopping Center



Construction of the AAFES Shopping Center would include the following design principles:

- Antiterrorism Construction Standards – the new facility would incorporate Unified Facilities Criteria (UFC) 4-010-01 (*Department of Defense Minimum Antiterrorism Standards for Buildings*);
- Architectural Design Standards – the new facility would reflect modern design standardization with an emphasis on sustainability and would conform to criteria in and technical guidance of Military Handbook 1190 (*Facility Planning and Design Guide*); AFI 32-1023 (*Design and Construction Standards and Execution of Facility Construction Projects*); Air Force Handbook 32-1084 (*Facilities Requirements*); and UFC 3-600-1 (*Fire Protection Engineering for Facilities*). Objectives include low environmental impact, optimal and efficient use and reuse of materials and resources using the Leadership in Energy and Environmental Design (LEED) Green Building Rating System; and
- Parking lot design and construction would be in accordance with UFC 3-250-01FA, *Pavement Design for Roads, Streets, Walks and Open Storage Areas*. Concrete curb and gutter would be installed along the pavement edges and around the parking area islands and along the perimeter of parking areas.

### **Site Preparation**

The proposed construction site covers approximately 7 acres of which approximately .07 acres are impervious. The site is primarily covered by grass with a few trees and shrubs scattered over the nearly 10-acre parcel. The existing trees, shrubs, and topsoil would be cleared. Debris from previous development at the site remains below ground; this construction debris would be removed and the soil recompacted. Site grading would incorporate current layout of drainage swales located along the southwest/northwest and northeast sides of the site which drain to a low point in the northerly corner of the site. The manholes and catch basins would be adjusted to the new finished grade.



Driveway at the rear of the Commissary would be shared with the AAFES Shopping Center

## **2.2 NO-ACTION ALTERNATIVE**

The no-action alternative represents baseline conditions. Under the no-action alternative, the AAFES Shopping Center proposal would not be implemented and the services provided by the existing Base Exchange and gas station would continue. This alternative would not meet the future needs of the military members of Malmstrom AFB, their dependents, or retirees that require the use of these services.

## **2.3 ENVIRONMENTAL IMPACT ANALYSIS PROCESS**

This EA examines the affected environment for potential impacts from construction of the AAFES Shopping Center at Malmstrom AFB and compares those to the no-action alternative. It also examines the cumulative impacts within the affected environment of these alternatives as well as past, present, and reasonably foreseeable actions of the Air Force and other federal, state, and local agencies. The steps involved in the EIAP used to prepare this EA are outlined below.

1. *Conduct Interagency and Intergovernmental Coordination for Environmental Planning (IICEP).* IICEP requires comments to be solicited from local governments as well as federal and state agencies to ensure their concerns and issues about the AAFES Shopping Center proposal are included in the analysis. In October 2008, Malmstrom AFB sent IICEP letters to those agencies requesting their input on the proposal. The U.S. Fish and Wildlife Service responded with a determination that significant adverse effects on biological resources or habitats would be unlikely given the location of the proposed action. Chapter 6 provides the list of people and agencies contacted and Appendix A provides copies of IICEP correspondence.
2. *Prepare a draft EA and draft Finding of No Significant Impact (FONSI).* The first comprehensive documents for public and agency review are the draft EA and draft FONSI. These documents examine the environmental impacts of the proposed action and no-action alternative.
3. *Announce that the draft EA and draft FONSI have been prepared.* Advertisements were placed in the *Great Falls Tribune* and the base newspaper notifying the public as to the availability of the draft EA and draft FONSI for review in the Great Falls Public Library and Arden G. Hill Memorial Library. After the draft EA and draft FONSI were distributed, a 30-day public comment period commenced. The 30-day public comment period occurred from February 9 to March 10, 2009.
4. *Provide a public comment period.* The goal during this process is to solicit comments concerning the analysis presented in the draft EA and draft FONSI. Comments were received from the Cascade County Conservation District and the U.S. Fish and Wildlife Service, Montana Field Office. These letters are included in Appendix A.

5. *Prepare a final EA.* Following the public comment period, a final EA is prepared. This document is a revision (if necessary) of the draft EA, includes consideration of public and agency comments, and provides the decision maker with a comprehensive review of the proposed action and the potential environmental impacts.
6. *Issue a FONSI.* The final step in the process is either a signed FONSI, if the analysis supports this conclusion, or a determination that an environmental impact statement (EIS) would be required for the proposal.

## **2.4 OTHER REGULATORY AND PERMIT REQUIREMENTS**

This EA was prepared in compliance with NEPA, other federal statutes, such as the Clean Air Act (CAA), the Clean Water Act (CWA), Endangered Species Act (ESA), the National Historic Preservation Act, Executive Orders, and other applicable statutes and regulations. Malmstrom AFB initiated informal consultation with the U.S. Fish and Wildlife Service (USFWS) and the Montana State Historic Preservation Office (SHPO) through IICEP letters.

Prior to any construction activities, Malmstrom AFB would acquire the appropriate construction and operation permits to include an underground storage tank (UST) permit.

## **2.5 MITIGATION MEASURES**

In accordance with 32 CFR Part 989.22, the Air Force must indicate if any mitigation measures would be needed to implement the proposed action at Malmstrom AFB. No mitigation measures will be needed to arrive at a finding of no significant impact if the proposed action were selected for implementation at Malmstrom AFB.

## **2.6 SUMMARY OF IMPACTS**

According to the analysis in this EA, implementation of the proposed action would not result in long-term adverse or significant impacts to any resource category. Implementing either the proposed action or no-action alternative would not significantly affect existing conditions at Malmstrom AFB. The following summarizes and highlights the results of the analysis by resource category.

***Air Quality.*** Impacts to air quality associated with construction activities would be short-term and contribute less than 0.1 percent to the regional air emissions, thereby not resulting in any adverse or significant impacts to regional air quality. Under the no-action alternative, impacts to air quality would not be expected since baseline emissions would remain unchanged; therefore, implementing the no-action alternative would not result in adverse effects to the regional air quality.



***Soils and Water Resources.*** No long-term adverse impacts to soils or surface water would occur; most impacts would be short-term resulting in negligible effects. Groundwater sources would not be affected from construction activities associated with the proposed action and no wetlands were found at or near the proposed project site. The amount of impervious surface at Malmstrom AFB would increase by approximately 4.4 acres in Drainage Area 2 with construction of the AAFES Shopping Center; however, a series of stormwater basins would provide on-site water filtration and retention that would reduce stormwater runoff to negligible levels. Under the no-action alternative, the Shopping Center would not be constructed on Malmstrom AFB at this time; therefore, impacts to these resources beyond baseline conditions would not be expected.

***Biological Resources.*** No long-term impacts to vegetation or wildlife would be expected. No threatened, endangered, or sensitive species are known to occur on Malmstrom AFB; therefore, these resources would not be subjected to adverse impacts under the proposed action. Under the no-action alternative, no changes to existing biological resources would occur since the AAFES construction proposal would not take place.

***Cultural Resources.*** No architectural, archaeological, or traditional resources are found at the site proposed for construction; therefore, no impact to these resources would be anticipated. Under the no-action alternative, ground disturbance would not occur since the proposed AAFES Shopping Center would not be constructed on Malmstrom AFB; no changes to the existing conditions of cultural resources would occur as a result of the no-action alternative.

***Socioeconomics.*** A short-term, positive input into the regional economy would occur during the 17-month construction period. No changes would be anticipated with implementation of the no-action alternative.

***Land Management and Use.*** A waiver would be needed prior to construction to change the land use designation from Open Space to Community Commercial; no impacts from implementing this change would be anticipated. No impacts or change to the land use designation would occur under the no-action alternative.

***Hazardous Materials and Waste Management.*** No changes to hazardous materials or waste streams would occur. No Installation Restoration Program (IRP) sites would be disturbed as none are found in the project area. No impacts to the handling of hazardous materials or waste management would occur through implementation of the no-action alternative since the AAFES Shopping Center would not be constructed.

## **CHAPTER 3**

# **DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

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## **CHAPTER 3**

# **DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

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### **3.1 ANALYSIS APPROACH**

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. It also provides that an EA should consider, but not analyze in detail, those areas or resources not potentially affected by the proposal. Therefore, an EA should not be encyclopedic; rather, it should be succinct. NEPA also requires a comparative analysis that allows decisionmakers and the public to differentiate among the alternatives. This EA therefore, focuses on those resources that would be affected by the proposed construction of an AAFES Shopping Center on Malmstrom AFB, Montana.

CEQ regulations (40 CFR Parts 1500-1508) for NEPA also require an EA to discuss impacts in proportion to their significance and present only enough discussion of other than significant issues to show why more study is not warranted. The analysis in this EA considers the current conditions of the affected environment and compares those to conditions that might occur should either the proposed action or no-action alternative be implemented.

#### ***Affected Environment***

Evaluation and analysis of the proposed action indicate that resources generally subject to ground disturbing activities have the highest potential to be affected. For this EA, the potentially affected environment centers on the proposed construction location as well as the natural, cultural, and socioeconomic resources they contain or support.

#### ***Resources Analyzed***

Table 3.1 presents the results of the process of identifying resources to be analyzed in this EA. This assessment evaluates air quality; soils and water resources; biological resources; cultural resources; socioeconomics; land management and use; and hazardous materials and waste management. These resources are analyzed because they may be potentially affected by implementation of the proposed action.

**Table 3.1 Resources Analyzed in the Environmental Impact Analysis Process**

<i>Resource</i>	<i>Potentially Affected by Proposed Action Activities</i>	<i>Analyzed in this EA</i>
Air Quality	Yes	Yes
Soils and Water Resources (includes Wetlands)	Yes	Yes
Biological Resources	Yes	Yes
Cultural Resources	Yes	Yes
Socioeconomics	Yes	Yes
Land Management and Use	Yes	Yes
Hazardous Materials and Waste Management	Yes	Yes
Noise	No	No
Health and Safety	No	No
Transportation	No	No
Environmental Justice and Protection of Children	No	No
Floodplains	No	No

***Resources Eliminated from Further Analysis***

Numerous resources were assessed (refer to Table 3.1) that, in accordance with CEQ regulations warrant no further examination in this EA. The following provides these resources and describes the rationale for this approach.

**Noise.** Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Human response to noise varies by the type and characteristics of the noise source, the distance from the source, receptor sensitivity, and time of day. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by stationary or mobile sources. Sound levels are expressed in decibels (dB), usually weighted for human hearing (dBA). Noise from construction activities would be localized, short-term, and intermittent, resulting in no measurable effect to the adjacent facilities; normal modern construction methods and material commonly reduce interior noise levels by 20 dB (NAS 2005). In addition, noise typically is attenuated 6 dB for every doubling of distance from the source (FICON 1992). The daily operation of motor vehicles in and around Malmstrom AFB is considered a minor source of noise. Typically, the noise level for vehicle operations would range from 50 dB (for light traffic) to 80 dB for diesel trucks. Noise due to construction vehicles and equipment would not change baseline noise levels on the installation; therefore, further evaluation of this resource is not warranted. Baseline noise levels on the base would not be expected to change through implementation of the no-action alternative.

**Health and Safety.** Effects to health and safety in relation to construction activities would be minimal and no different from standard, on-going activities occurring at Malmstrom AFB. During construction, prescribed industrial safety standards would be followed. There are no specific aspects of this proposal’s construction operations that would create any unique or extraordinary safety issues. Since no aspect of

the project proposal or the no-action alternative would alter the health and safety conditions to persons on the base, this resource has been eliminated from further analysis.

**Transportation.** Transportation resources refer to the infrastructure and equipment required for the movement of people, raw materials, and manufactured goods in geographic space. Regional access to Malmstrom AFB is provided from U.S. Highway 87/89, east of I-15. 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. Malmstrom AFB has one stoplight, located at the intersection of Goddard Avenue and 72<sup>nd</sup> Street North. The threshold of significance under transportation resources is the potential for the proposed action to adversely impact traffic patterns within and access to Malmstrom AFB. Construction traffic is authorized access through only the North Gate (10<sup>th</sup> Avenue North) which could lead to minor congestion during peak periods during the week; however the impacts would be short-term; the overall impact to transportation resources would be minor and not adverse. No impacts to transportation resources would be expected through implementation of the no-action alternative under which the AAFES Shopping Center would not be constructed.

**Environmental Justice and Protection of Children.** In 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, was issued to focus attention of federal agencies on human health and environmental conditions in minority and low-income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed. In 1997, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children)*, was issued to ensure the protection of children. Environmental justice addresses the disproportionate effect of a federal action on low-income or minority populations. If implementation of the proposed action were to have the potential to significantly affect people, those effects would have to be evaluated for how they adversely or disproportionately affect low-income or minority communities. Because the proposed action takes place within the confines of the base, no disproportionate populations occur within the areas affected by the proposed action; minority or low-income groups would not be disproportionately affected by implementation of the proposed action. No aspect of this construction proposal would place children at risk. In summary, there would be no anticipated disproportionate impact to the human health or environmental conditions in minority or low-income communities. Neither the proposed action or no-action alternative would result in an adverse impact to the health and safety of children; therefore, further analysis of this resource is not warranted for this EA.

**Floodplains.** Floodplains are, in general, those lands most subject to recurring floods, situated adjacent to rivers and streams, and coastal areas. As a topographic category, a floodplain is quite flat and lies adjacent to a stream or river. Floods are usually described in terms of their statistical frequency. A "100-year flood" or "100-year floodplain" describes an event or an area subject to a percent probability of a

certain size flood occurring in any given year. Because floodplains can be mapped, the boundary of the 100-year flood is commonly used in floodplain mitigation programs to identify areas where the risk of flooding is significant. Malmstrom AFB is located on a high plateau approximately 1 mile south of the Missouri River and is about 100 feet above the 100-year floodplain of the river. In 1979, the Federal Emergency Management Agency performed a floodplain insurance study on all streams in Cascade County considered to have severe flooding problems. No area on Malmstrom AFB was considered within a floodplain. Further evaluation of this resource for the proposed action and no-action alternative is not warranted.

### ***Resources Carried Forward for Detailed Analysis***

As presented in Table 3.1, the following resources are evaluated in this EA: air quality; soils and water resources; biological resources; cultural resources; socioeconomics; land management and use; and hazardous materials and waste management.

## **3.2 AIR QUALITY**

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

The 1970 Clean Air Act (CAA) and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for seven "criteria" pollutants: ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter equal to or less than 10 and 2.5 microns (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb). These standards, presented in Table 3.2, represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. On March 12, 2008, the U.S. Environmental Protection Agency (USEPA) promulgated a revision to the 8-hour ozone standard for ground-level ozone, reducing it from 0.08 parts per million to 0.075 parts per million. It became effective on June 12, 2008. In addition to the national standards, the Montana Department of Environmental Quality (DEQ) has additional standards which are also included in Table 3.2.

Based on measured ambient criteria pollutant data, the USEPA designates all areas of the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. The CAA requires each state to develop a State Implementation Plan (SIP) that is its primary mechanism for ensuring that the NAAQS are achieved and maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. The

CAA provides that federal actions in nonattainment and maintenance areas will not hinder future attainment with the NAAQS and must conform to the applicable SIP (i.e., Montana SIP).

**Table 3.2 Montana and National Ambient Air Quality Standards**

<b>POLLUTANT<sup>a</sup></b>	<b>AVERAGING TIME</b>	<b>MONTANA<sup>b</sup></b>	<b>NATIONAL PRIMARY</b>	<b>NATIONAL SECONDARY</b>
Ozone (O <sub>3</sub> )	8 Hours	---	0.75 ppm <sup>c</sup>	Same as Primary
	1 Hour	0.10 ppm	---	---
Carbon Monoxide (CO)	8 Hours	9.0 ppm	9.0 ppm	None
	1 Hour	23 ppm	35 ppm	
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Arithmetic Mean	0.053 ppm	0.053 ppm	Same as Primary
	1 Hour	0.30 ppm	---	---
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	0.02 ppm	0.03 ppm	None
	24 Hours	0.10 ppm	0.14 ppm	
	3 Hours	---	---	0.50 ppm
	1 Hour	0.50 ppm	---	---
Particulate Matter (PM <sub>10</sub> )	24 Hours	---	150 µg/m <sup>3</sup> <sup>b</sup>	Same as Primary
Particulate Matter (PM <sub>2.5</sub> )	Annual	---	15 µg/m <sup>3</sup>	Same as Primary
	24 Hours	---	65 µg/m <sup>3</sup>	---
Lead (Pb)	Quarterly Arithmetic Mean	---	1.5 µg/m <sup>3</sup>	Same as Primary
Settled Particulate Matter	30-Day	10 g/m <sup>2</sup>	--	--
Fluoride in Forage	Monthly Average	50 µg/g	--	--
	Grazing Season Average	35 µg/g	--	--

*Notes:*  
<sup>a</sup> The National standards, other than for ozone and those based on annual averages, must not be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.  
<sup>b</sup> To obtain specific information on the Montana standards, consult Administrative Rules of Montana, Chapter 8, Subchapter 2, Rule 17.8.  
<sup>c</sup> ppm = parts per million by volume, µg/m<sup>3</sup> = micrograms per cubic meter, µg/g = microgram per gram, g/m<sup>2</sup> = grams per square meter.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs). Examples of HAPs include benzene, which is found in gasoline; perchlorethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds. The majority of HAPs are volatile organic compounds (VOCs).

As part of the CAAA of 1977, Congress established the New Source Review (NSR) program. This program is designed to ensure that air quality is not significantly degraded from the addition of new and modified factories, industrial boilers, and power plants. In areas with unhealthy air, NSR assures that new emissions do not slow progress toward cleaner air. In areas with clean air, especially pristine areas like designated Class I areas, NSR assures that new emissions do not significantly worsen air quality.

Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As a 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 and national parks greater than 6,000 acres in existence in 1977. In Class I areas, visibility impairment is defined as atmospheric discoloration (such as from an industrial smokestack) and a reduction in regional visual range. Visibility impairment or haze results from smoke, dust, moisture, and vapor suspended in the air. Very small particles are either formed from gases (sulfates, nitrates) or are emitted directly into the atmosphere from sources like electric utilities, industrial fuel burning processes, and vehicle emissions.

Stationary sources, such as industrial areas, are typically the issue with visibility impairment in Class I areas, so the permitting process under the PSD program requires a review of all Class I areas within a 62-mile (100-kilometer [km]) radius of a proposed industrial facility. The United States Forest Service (USFS), the National Park Service (NPS), and the USFWS; hereafter referred to as the Agencies, have concluded that an approach similar to the one used in USEPA's Regional Haze Regulation has merit for evaluating air pollution sources with relatively steady emissions throughout each year with respect to new source impacts at Class I areas. The new Federal Land Manager's Air Quality Related Values (AQRV) Workgroup Final Draft Phase I Report (USFS/NPS/USFWS 2008) presents new initial screening criteria that would exempt a source from AQRV impact review based on its annual emissions and distance from a Class I area.

The Agencies (i.e., USFS, NPS, and USFWS) are using an approach similar to the USEPA's evaluation method in the Regional Haze Rule, but are modifying the size criteria to also include Particulate Matter less than 10 microns in size ( $PM_{10}$ ) and sulfuric acid mist ( $H_2SO_4$ ) emissions because those pollutants also impair visibility and contribute to other resource impacts. In addition, the Agencies are using a fixed quality/distance (Q/D) factor of 10 as a screening criteria for sources located greater than 50 km from a Class I area. Furthermore, the Agencies are expanding the screening criteria to include all AQRV, not just visibility. Therefore, the Agencies will consider a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRV if its total  $SO_2$ , nitrogen oxides ( $NO_x$ ),  $PM_{10}$ , and  $H_2SO_4$  annual emissions (in tons per year, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. The Agencies will not request any further Class I AQRV impact analyses from such sources.

Pollutants considered in the analysis for this EA include the criteria pollutants and HAPs. The criteria pollutants are generated by numerous sources, including diesel exhaust from construction equipment and operations such as fueling and painting. HAPs are present in fuel. These include VOCs and  $NO_x$  which are precursors (indicators of)  $O_3$  and other compounds such as CO,  $SO_2$ , and  $PM_{10}$ . Airborne emissions of  $PM_{2.5}$ , Pb, and hydrogen sulfide ( $H_2S$ ) are not addressed because the affected environment (i.e., Malmstrom AFB) contains no significant sources of these criteria pollutants, it is not located within a nonattainment area for these pollutants ( $PM_{2.5}$ , Pb, and  $H_2S$ ), nor are these pollutants associated with the proposed action construction activities and no-action alternative.

### 3.2.1 Affected Environment

The affected environment varies according to pollutant. For pollutants that do not undergo a chemical reaction after being emitted from a source (PM<sub>10</sub>, CO, and SO<sub>2</sub>), the affected area is generally restricted to a region in the immediate vicinity of the base. However, the region of concern for O<sub>3</sub> and its precursors (NO<sub>x</sub> and VOCs) is a larger regional area (i.e., the Great Falls Intrastate Air Quality Control Region [AQCR]) because they undergo a chemical reaction and change as they disperse from the source. This change can take hours, so depending upon weather conditions, the pollutants could be some distance from the source. Impacts of the proposed action can be evaluated in the context of the existing local air quality, the baseline emissions for the base and region, and the relative contribution of the proposed action to regional emissions.

*Base Environment.* The Montana DEQ has primary jurisdiction over air quality and sources of stationary source emissions at Malmstrom AFB. Malmstrom AFB is a major source of criteria pollutants and a minor source of HAPs. Potential emissions of criteria pollutants exceed the 100 tons per year threshold at the installation for NO<sub>x</sub>, CO and SO<sub>x</sub>. The base has the potential to emit over 250 tons per year of NO<sub>x</sub>. Malmstrom AFB operates under a Title V permit. Under Title V of the CAA, Malmstrom AFB is required to obtain construction and operation permits from the Montana DEQ Air Resources Management Bureau for certain emission sources and their associated air pollution control equipment. The base currently holds an air quality operating permit (OP1427) for air emissions. The permit includes a list of the applicable regulations, the emissions limits, and specifies how equipment is to be operated in order to minimize emissions. Stationary source emissions at Malmstrom AFB under baseline conditions (and under no-action) include external combustion units (e.g., boilers and water heaters); fuel dispensing and storage tanks; landfills; emergency generators; coal yard; and mobile emissions that include those from government-owned vehicles (Air Force 2008a).

Potential Air Emissions (tons per year)	
PM <sub>10</sub> /PM <sub>2.5</sub>	159.00
NO <sub>x</sub>	341.81
CO	145.06
SO <sub>x</sub>	166.88
VOC	101.61
HAPs	23.32

Source: Malmstrom AFB 2007 Air Emissions Inventory (Air Force 2008a).

*Regional Environment.* Malmstrom AFB is located in the Great Falls AQCR. This AQCR includes the counties of Blaine, Cascade, Chouteau, Glacier, Hill, Liberty, Pondera, Teton, and Toole. The region 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. Cascade County is classified as “better than national standards” for SO<sub>2</sub> and “cannot be classified or better than national standards” for NO<sub>2</sub>. Cascade County is designated as “unclassifiable/attainment” for PM<sub>2.5</sub> and O<sub>3</sub>, “unclassifiable” for PM<sub>10</sub>, and is designated as “attainment” (in 2002) for CO.

The air quality analysis will primarily focus on the impacts to the city of Great Falls in Cascade County, Montana, which is where Malmstrom AFB is located. Malmstrom AFB is located on the eastern edge of Great Falls, Montana, which has a small area within the corporate limits that was designated as nonattainment for CO in September 1980. Currently, this area of Great Falls is designated attainment for

CO, and is managed under the *Great Falls Carbon Monoxide Limited Maintenance Plan*. None of Malmstrom AFB falls within the borders of the area managed under this plan (Montana SIP 2000). Mobile sources, including aircraft and their operations at Malmstrom AFB, are generally exempt from review under this regulation. While the review under the PSD permit program does not apply directly to base operations at Malmstrom AFB, this analysis evaluated emissions from construction activities for reviewing potential visibility impacts.

There are 12 Class I areas designated in Montana. Of these, only one is located within 100 km of Malmstrom AFB, and that is Gates of the Mountain Wilderness Area. This Wilderness Area is 50 miles (80 km) southwest of Great Falls and Malmstrom AFB.

### **3.2.2 Environmental Consequences**

The CAA prohibits federal agencies from supporting activities that do not conform to a SIP that has been approved by the USEPA. To assess the effects of the proposed action, analysis must include direct and indirect emissions from all activities that would affect the regional air quality. Emissions from proposed actions are either “presumed to conform” (based on emissions levels which are considered insignificant in the context of overall regional emissions) or must demonstrate conformity with approved SIP provisions.

#### **Proposed Action**

The air quality analysis for the proposed action at Malmstrom AFB quantifies the changes (increases and decreases) due to construction and operational activities associated with the proposed AAFES Shopping Center. The approach used under the air quality analysis was to evaluate construction activities (grading; filling; and building, parking, and stormwater basin construction). The construction phase would extend from 2009 to 2010. Once construction reaches completion, operations would commence, with resultant operational emissions associated with boilers, fuel storage and refueling activities, and commuting workers, as examples. Table 3.3 provides the estimated emissions from construction under the proposed action. The emissions associated with the proposed action include fugitive dust (PM<sub>10</sub> and PM<sub>2.5</sub>) from construction, fill, grading, and combustion (primarily CO and NO<sub>x</sub> and smaller amounts of VOCs, SO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>) from heavy-duty diesel construction equipment exhaust (e.g., trucks, dozers, cranes, and rollers).

#### **Construction**

During the construction period, a shopping center building, parking lot, and retail fueling site would be developed. In general, VOC, CO, NO<sub>x</sub>, and SO<sub>2</sub> emissions are primarily generated by diesel-fueled heavy equipment operating in the construction areas. Particulate matter emissions, in the form of PM<sub>10</sub> and PM<sub>2.5</sub> are released by heavy equipment and also are due to fugitive dust created by land disturbance activities, which include land clearing; soil excavation, cutting and filling; trenching; and grading.

<b>Table 3.3 Projected Emissions from Implementation of the Proposed Action (tons/year)</b>						
	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Cascade County Baseline <sup>1</sup>	446	5,568	1,060	111	99.3	90.2
Construction Year 2009	0.2	0.8	1.0	0.1	0.9	0.1
Construction Year 2010	0.2	0.7	0.9	0.1	0.8	0.1
% of Baseline	0.04	0.01	0.09	0.09	0.91	0.11

Source: <sup>1</sup>USEPA 2001, Cascade County Off-Highway Vehicles.

The fugitive dust emission factor for PM<sub>10</sub> (which is used as part of the PM<sub>2.5</sub> calculation) is assumed to include the effects of typical control measures such as routine site watering for dust control. A dust control effectiveness of 50 percent is assumed, based on the estimated control effectiveness of watering.

The calculated emissions (summarized in Table 3.3) include exhaust emissions from heavy construction equipment, fugitive dust emissions from land disturbance activities, and exhaust emissions from commuting construction worker vehicles in operation while on the base (in transit within the installation fence line). The impact of construction workers commuting to and from the installation and their homes was not evaluated based on the assumption that the construction workers are considered permanent residents of the region, and would be driving to work at another construction project if they were not driving to the installation for construction work.

The construction emission totals were compared to the baseline of the Cascade County 2001 emission inventory (USEPA 2001) for off-highway vehicles to assess the impact of the construction emissions to the local air quality. The off-highway vehicle baseline was chosen because most of the emissions generated by construction of the AAFES Shopping Center would be due to the emissions from heavy equipment. The comparison is expressed as a percentage of the baseline inventory for Cascade County.

Impacts to air quality associated with construction activities would be short-term and contribute less than 0.1 percent to the regional air emissions, thereby not presenting any adverse or significant impacts to regional air quality. During construction, fugitive dust would be minimized through implementation of dust control measures (i.e., water application on soil).

As indicated in Table 3.3, the construction emissions are insubstantial in comparison to the off-highway county baseline, with none of the pollutant emissions projected to even account for 1 percent of the baseline. The result of the construction emission analysis indicates virtually no impact on the local or regional air quality.

## **Operations**

Operationally, air emissions of concern include VOCs and HAPs from fueling operations associated with the retail gas station, emissions from external fuel combustion sources such as boilers, and HAPs associated with indoor air quality.

Because of the installation of a retail fueling station as part of the AAFES Shopping Center, Malmstrom AFB would have to submit a permit to construct and request revision of their Title V operating permit to include two new 15,000-gallon gasoline USTs. The three 10,000 gallon USTs currently in operation are expected to be made non-operational; therefore, the action would be expected to be an administrative change. Because the new fueling station is anticipated to replace an existing facility and the storage capacity would remain the same, there is no expectation that there would be any air emission increases due to installation of a newer facility. HAPs would not be expected to increase from implementing the proposed action. In addition, the new fuel dispensers would use the same Stage II vapor recovery system utilized in the existing fuel dispensers (ALSC 2008; Air Force 2008a). Additionally, unless the AAFES Shopping Center is tied in to the central heating system at the base, the 40,300-square foot facility would require one or more heating units. These would most likely consist of one or more hot water boilers rated less than 10 MM BTU/hr that are fueled by natural gas. These heating units would serve to heat the building and would likely be more efficient than the older units currently in operation in buildings 1150 and 685. For this analysis, it is assumed that buildings 1150 and 685 would be made non-operational. Depending on the size of the boiler(s) in the new facility, the addition of it/they would likely be added to the Malmstrom AFB Title V permit as an insignificant source(s).

Malmstrom AFB is located 80 km from the nearest Class 1 area. The Agencies' approach of Q/D was used to determine whether the base potential to emit emissions of PM<sub>10</sub>, NO<sub>x</sub>, or SO<sub>2</sub> would drive a requirement for further evaluation. The conclusion is that the Q/D value would be less than 10 indicating that no further Class 1 AQRV impact analysis would be necessary.

Use of LEED for new construction offers many benefits including environmental, economic, and occupant-oriented performance and health advantages. LEED certified projects provide specific air quality benefits through the use of optimized energy performance and conservation features, increased ventilation, low pollutant emitting materials in construction (such as adhesives and sealants, carpeting, etc.), and indoor chemical and pollutant source controls. Integrating LEED concepts into the shopping center construction would ensure that human exposures to HAPs in the indoor air would be reduced as compared to use of more traditional construction techniques and material selection.

In conclusion, construction and operation of the AAFES Shopping Center would result in negligible impacts to air quality in the region; the operational emissions are not expected to perceptibly change annual emissions. Malmstrom AFB is in an attainment area and as such general conformity regulations do not apply.

## **No-Action Alternative**

Under the no-action alternative, the AAFES Shopping Center would not be constructed on Malmstrom AFB at this time. Impacts to this resource would not be expected since baseline emissions (as described under the affected environment, Table 3.3) would remain unchanged; therefore, implementing the no-action alternative would not result in adverse effects to the regional air quality.

### **3.3 SOILS AND WATER RESOURCES**

Soil, in general, refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support structures and facilities. Relative to development, soils typically are described in terms of their type, slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of land use.

Water resources for this EA refer to surface and subsurface water, including lakes, ponds, rivers, and streams within a watershed affected by existing and potential soil erosion and runoff from the base. Subsurface water, commonly referred to as groundwater, is typically found in areas known as aquifers. Groundwater is typically recharged during precipitation events and is withdrawn for domestic, agricultural, and industrial purposes.

Wetlands are considered special category sensitive habitats and are subject to regulatory authority under Section 404 of the CWA and Executive Order 11990 *Protection of Wetlands*. They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the U.S. Army Corps of Engineers (USACE) and USEPA as those areas that meet all the criteria defined in the USACE's 1987 *Wetlands Delineation Manual* and under the jurisdiction of the USACE (USACE 1987). The CWA of 1972 is the primary federal law that protects the nation's waters, including lakes, rivers, aquifers, and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters.

#### **3.3.1 Affected Environment**

Malmstrom AFB sits near the southern edge of the North Central Brown Glaciated Plains in the Northwestern Glaciated Plains Ecoregion (Woods *et al.* 2002). Isolated mountain ranges rise 2,000 to 4,000 feet (610 to 1,220 meters) above the plains. The Rocky Mountains are 35 miles (56 km) to the west; the Highwood Mountains are 20 miles (32 km) to the east-south-east; and the Little Belt Mountains are 30 miles (48 km) to the south and southwest. The continental divide is approximately 75 miles (121 km) to the west of the base. Gently sloping plains, moderately dissected by numerous streams characterize the topography in the vicinity of the base. The upland surface of the base is between 3,400 to

3,500 feet (1,037 to 1,068 meters) above mean sea level and approximately 300 feet (92 meters) above the adjacent Missouri River Valley. No major drainages are within the base's boundaries (Air Force 2008b).

## **Soils**

Soils within the boundaries of Malmstrom AFB have developed directly on regional Quaternary glacial deposits that overlie Early Cretaceous shale and sandstone formations. Lawther silty and Dooley sandy loam series cover approximately 75 percent of the base's area (Figure 3.1). Other soils within the base include sandy loams, loamy sands, and alluvial silty clay loams (SCS 1982). The proposed project site is in an area of Dooley series soils. Generally, the Dooley series are deep, well-drained soils formed in alluvium or eolian sands over glacial till (SCS 1982). Permeability is slow and available water capacity is moderate. Soils are mildly alkaline in the upper 10 inches (25 centimeters) and moderately alkaline below (Air Force 2008b).

A hospital building that formerly occupied the proposed project site was demolished and the building site was filled. The geotechnical investigation conducted for this project notes on-site subsurface materials generally consist of recent fill or wind-blown sandy materials overlying glacially deposited lean clay with sand till materials. The glacial till materials are moderately to highly plastic with a moderate to high potential for swell/heave related concerns with moisture increase. The existing site slopes generally from the south to the north/northwest at an average slope of 1.7 percent (NTL 2008).

## **Water Resources**

The water resources section describes the ground and surface water resources, stormwater runoff, and includes a discussion on wetlands.

### ***Groundwater***

Groundwater resources include both deep and shallow aquifers. Deep confined aquifers range in depth between 100 feet and 500 feet below the ground surface of Malmstrom AFB. Shallow ground water occurs locally as noncontiguous, unconfined perched zones, encountered between 3 and 20 feet below the ground surface (Air Force 2008b). The deep confined aquifers tend to flow northward; the shallow aquifers flow generally along topographic gradients (Air Force 2008b).

### ***Surface Water***

The Missouri River is the major surface water body in the region. It flows north and northeast approximately 1 mile north of Malmstrom AFB. It is the primary source of potable water for Malmstrom AFB and the city of Great Falls (Air Force 2008b). Malmstrom AFB sits on a plateau that drains northward toward the Missouri River. Stormwater runoff from the base is directed to six natural drainages that carry water off the base. These drainages join one principal coulee, known locally as

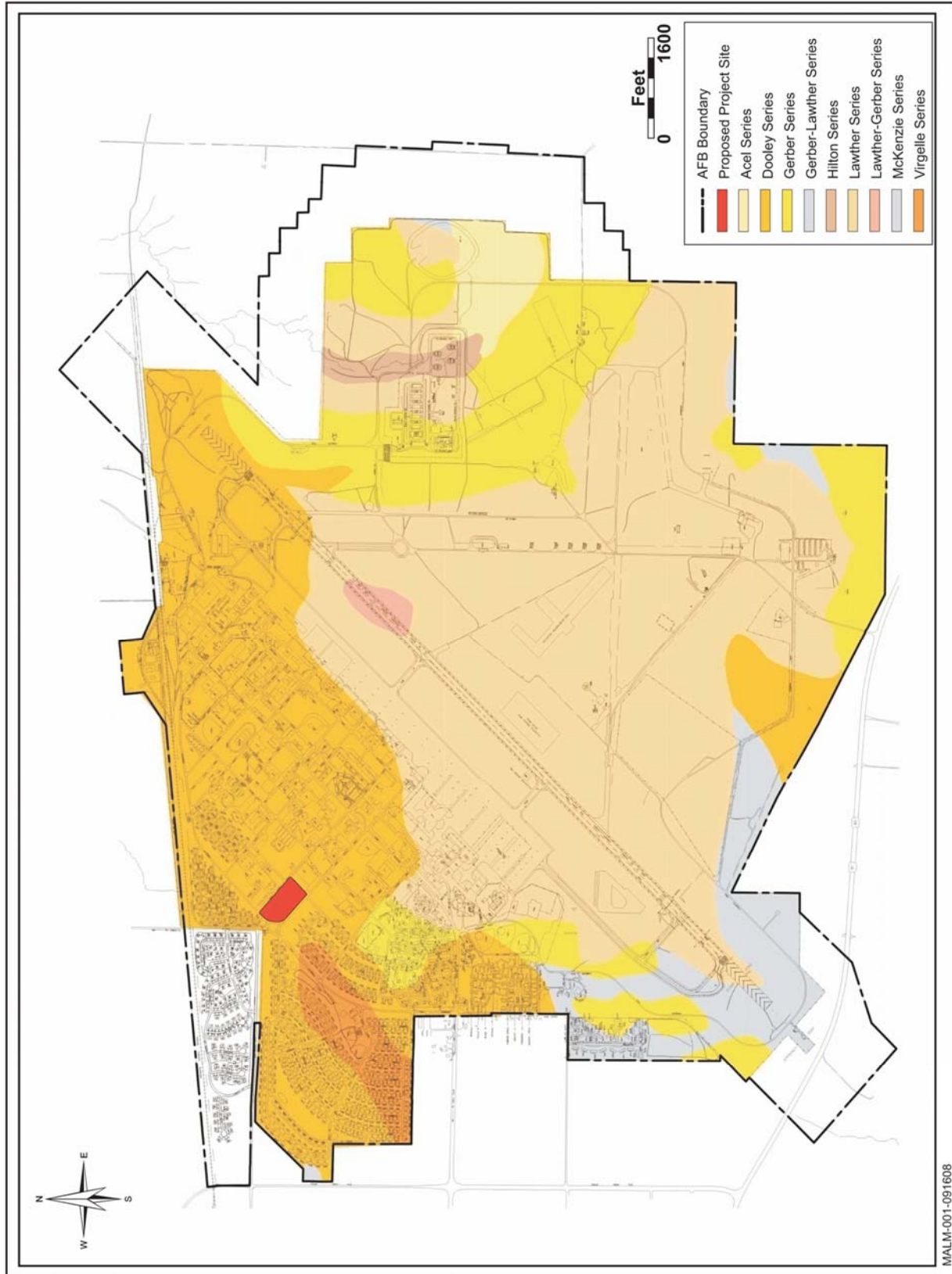


Figure 3.1 Soil Types found on Malmstrom AFB



Whitmore Ravine that discharges into the river about one mile downstream of Rainbow Dam, approximately 1.7 miles from the north base boundary (Air Force 2008b).

***Stormwater***

Malmstrom AFB has an estimated 662 acres of impervious area out of a total of approximately 3,600 acres. Stormwater on the base drains into nine (9) drainage areas. The drainage areas consist of a system of swales, open trenches, and covered pipes that direct flow to six (6) permitted outfalls (Air Force 2006a). Figure 3.2 provides the drainage pattern from Malmstrom AFB while Figure 3.3 provides the location of the drainage areas and outfalls on the installation.

The proposed project site is within Drainage Area 2. This drainage area covers a total surface area of 194 acres and has approximately 125 acres of impervious surface; approximately 69 acres is pervious surface. Drainage Area 2 collects stormwater runoff from the north central portion of the base. The drainage flows north until it discharges off base via stormwater Outfall 2. The basin drains by a combination of underground concrete pipes, grass-lined ditches, and curb and gutters in streets and roadways. Above ground curb and gutters and ditch flow comprise over 70 percent of the flow pathway. The underground flow is confined to the vehicle maintenance and storage facility area located in the northeast corner of the drainage area. The outfall collection channel near Walnut Street is an unlined ditch that passes under a railroad track via two 36-inch concrete pipes and under the north boundary road via one 48-inch corrugated metal pipe. Drainage Area 2 combines with the flow from Drainage Area 1 in the west branch of Whitmore Ravine then flows north to the Missouri River approximately one mile north of the base boundary. The measured peak discharge at the Walnut Street stormwater outfall discharge point (i.e., Outfall 2) for a 0.25-inch in 2.5 hours rain event was 10.2 cubic feet per second (cfs) (Air Force 2006b).

Malmstrom AFB complies with the Montana Pollutant Discharge Elimination System (MPDES) Phase II stormwater discharge permit regulations for Small Municipal Separate Storm Sewer Systems. The 341<sup>st</sup> Civil Engineer Squadron Asset Management Flight (341 CES/CEAN) provides oversight and management of the stormwater program, including the following permits:

- General Permit for stormwater discharges associated with Industrial activities (Authorization Number MTR 000197).
- General Permit for stormwater discharges associated with Small Municipal Separate Storm Sewer System (Authorization Number MTR 040008).

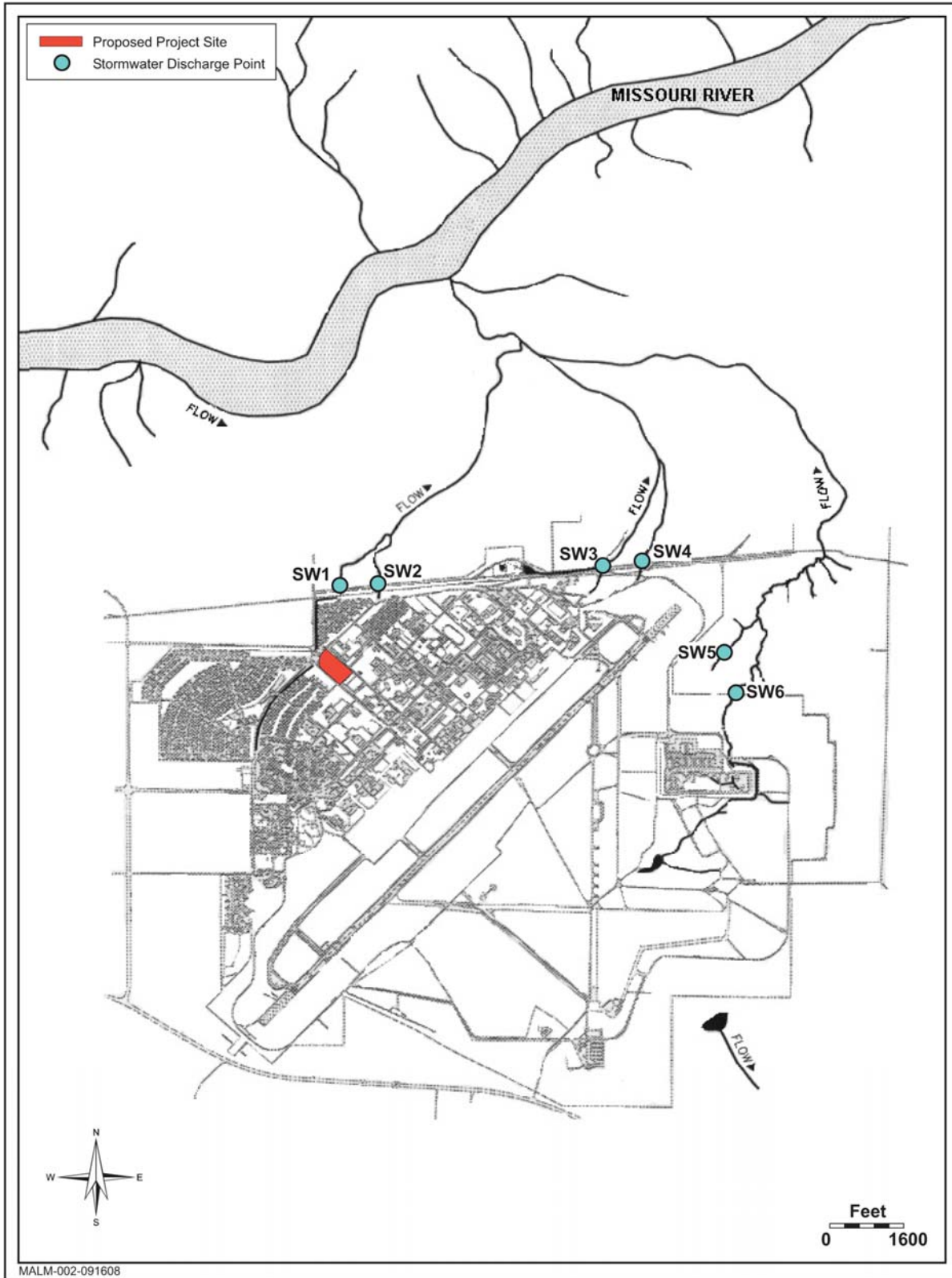
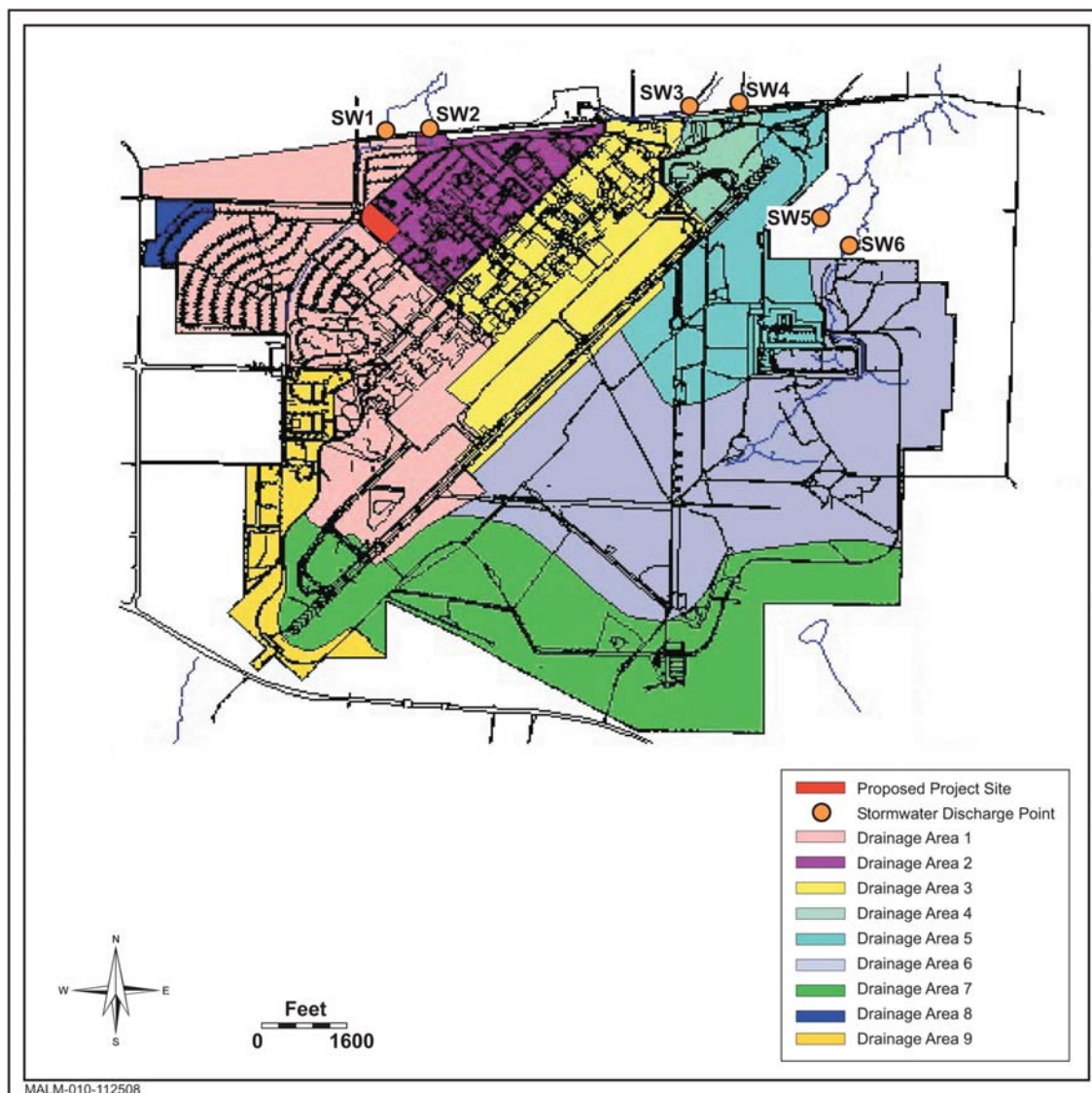


Figure 3.2 Stormwater Flow from Malmstrom AFB



**Figure 3.3 Drainage Areas and Stormwater Outfalls on Malmstrom AFB**

### ***Wetlands***

The entire base was surveyed in July 2001 for wetlands using on-site field methods outlined in the 1987 USACE Wetlands Delineation Manual. In June 2006, another field survey was conducted on the base. Seventy-three sites were visited including sites identified in previous wetland inventories, new sites identified by Malmstrom AFB personnel, and the stormwater easement areas north of the base. Wetlands identified on base and later confirmed by the USACE are currently being validated by the USEPA to further validate the wetlands' status (Air Force 2008b). Figure 3.4 provides wetland sites on the base.





Figure 3.4 Location of Wetlands on Malmstrom AFB

Of the 72 sites inventoried within the boundaries of Malmstrom AFB, 14 sites were found to meet all three USACE parameters for wetlands (hydrophytic vegetation, wetland hydrology, and hydric soils), including 12 human-induced wetlands and 2 natural wetlands. Wetlands on Malmstrom AFB are all in the “palustrine” system, which designates a shallow, standing water pond environment. Subject to USEPA review, four of the wetlands on Malmstrom AFB are considered jurisdictional wetlands for purposes of the CWA. Other “non-jurisdictional” wetlands do, however, have wetland values and functions, support hydrophytic vegetation under current conditions, and are considered regulated wetlands for the purposes of Executive Order 11990 (Air Force 2008b).

### **3.3.2 Environmental Consequences**

Impacts to soils are considered significant if any ground disturbance or other activities would violate applicable Federal or state laws and regulations and the potential for Notices of Violation (NOV) for the failure to receive applicable state permits, such as a MPDES construction permit, prior to initiating a proposed action. Potential adverse effects to soils could result from ground disturbance leading to soil erosion, fugitive dust propagation, sedimentation, and release of pollutants such as hazardous materials and/or waste. The threshold level of significance for water quality is the violation of applicable Federal or state laws and regulations, such as the CWA and the potential for NOV for the failure to receive applicable Federal and state permits, such as a MPDES permit (required for all projects 1 acre or more in size), prior to initiating site development activities. An impact to water resources at Malmstrom AFB that arises from any constellation of parameters could be considered significant if an aquifer, groundwater table, or surface water body is altered or degraded resulting in a measurable and persistent change in groundwater recharge, water quantity, or water quality.

### **Proposed Action**

#### **Soils**

Slopes within the project area are slight, averaging 1.7 percent. However, water and wind erosion could occur during construction activities. Use of best management practices (e.g. sediment traps and silt fences) would reduce these impacts. The glacial till materials are moderately to highly plastic with a moderate to high potential for swell/heave related concerns with moisture increase. The geotechnical investigation report prepared for this project notes specific engineering considerations and controls to avoid negative impacts of existing soil conditions (NTL 2008). No adverse long term impacts to site soils would be expected.

## **Water Resources**

Water resources are surface and subsurface resources that are finite but renewable. Physical disturbances and material releases from construction activities may affect water resources. Under NEPA guidelines, any alteration or degradation of a surface water body, aquifer, groundwater table, or recharge rate resulting in measurable and persistent change in water quality would be a significant impact. Violation of federal or state water quality criteria resulting from the proposed action also would be considered a significant impact.

Infiltration rates depend on factors such as soil type, soil moisture, antecedent rainfall, cover type, impervious surfaces and surface retention. Travel time is determined primarily by slope, length of flow path, depth of flow, and roughness of flow surfaces. The size of the drainage area, infiltration rates, and runoff travel time control the rate of peak discharge. The location of the proposed development, the effects of natural or manmade active or passive control works, and the time distribution of rainfall during a given storm event can reduce water infiltration rates and speed up runoff travel time. Incremental increases of impervious surface may combine to significantly alter peak events or baseline flow in a watershed. Increased recharge or improved water quality are examples of beneficial impacts.

### ***Groundwater***

The proposed action would not be expected to adversely impact the pre-existing status of groundwater resources at Malmstrom AFB. Excavations would be shallow and would not intersect groundwater (except, possibly minor perched zones). Nine borings were collected at the site. During the collection, groundwater was reached at 9.7 feet below ground surface with one (1) boring; no other borings encountered water or seepage (ALSC 2008). 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 could be readily mitigated through implementation of appropriate construction/maintenance best management practices (Air Force 2006a).

### ***Surface Water***

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 and engineering controls as prescribed in the required site-specific Stormwater Pollution Prevention Plan, and compliance with the protective provisions of the mandatory State of Montana Storm Water Permit for the proposed action would significantly reduce the potential for construction related impacts to surface water resources. Under Montana law the proposed action requires a Montana Construction Storm Water Permit because this construction activity would disturb more than one (1) acre (Air Force 2006a).

**Stormwater**

Construction of facilities changes a watershed’s response to precipitation. The most common effects are reduced infiltration and decreased travel time, which increase peak discharges and runoff. Runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, soil moisture, antecedent rainfall, cover type, impervious surfaces and surface retention. Travel time is determined primarily by slope, length of flow path, depth of flow, and roughness of flow surfaces. Peak discharges are based on the relationship of these parameters and on the drainage area of the watershed, the location of the proposed development, the effect of any storage and other natural or manmade active or passive control works, and the time distribution of rainfall during a given storm event (USDA Technical Release 55). Incremental increases of impervious surface may combine to significantly alter peak events or baseline flow in a watershed. The total surface area of Drainage Area 2 is approximately 194 acres; of that area, 125 acres is impervious. Implementing the proposed action would increase the amount of impervious area in Drainage Area 2 by 4.4 acres, or approximately 2.3 percent.

<b>Drainage Area 2 (Surface Area)</b>		
	<b>Pervious Area (acres)</b>	<b>Impervious Area (acres)</b>
Baseline*	194.0	125.0
Proposed Action	189.6	129.4

Source: \*Air Force 2006c.

The potential impact from stormwater runoff due to an increase in impervious surface under the proposed action was evaluated. The methodology included stormwater controls necessary to retain 100 percent of the difference between pre-development and post-development for both a 10-year, 2-hour storm event and 10-year, 24-hour storm event using Low Impact Design (LID) development or on-site retention. LID would maintain the natural and existing hydrological function of the site by incorporating several methods to include integrating the site’s hydrology into the framework of the design, creating multi-functional landscapes, and controlling stormwater at the source. Rainfall information for the 10-year, 2-hour event was not available; however, information for the 10-year, 24-hour storm event was available and that information was used to calculate stormwater volumes (Taylor Engineering 2009).

Current estimates at the pre-developed site for a 10-year, 24-hour design storm would result in 24,002 cubic feet (CF) of stormwater; post-development under the same design storm would result in 38,668 CF of stormwater. The difference between the two volumes is 14,666 which is the volume that would need to be retained on-site. Currently, the project design includes stormwater retention areas along the southwest, northwest, and northeast perimeter of the parking lot (refer to Figure 2.1). Stormwater that would be retained on-site under a 10-year, 24-hour storm event under the current project design is 16,870 CF which exceeds the required storage capacity (Taylor Engineering 2009). As such, implementation of the proposed action would not be anticipated to result in adverse impacts to stormwater resources.

### ***Wetlands***

No wetlands are located within the proposed construction area of the AAFES Shopping Center. There would be no impact to this resource from implementation of the proposed action.

### **No-Action Alternative**

Under the no-action alternative, the AAFES Shopping Center would not be constructed at this time. Existing conditions (as described under the affected environment) would remain unchanged. As a result, there would be no impacts to soils or water resources at Malmstrom AFB if the proposed action were not implemented. No impacts to wetlands would occur with implementation of the no-action alternative.

## **3.4 BIOLOGICAL RESOURCES**

Biological resources encompass plant and animal species and the habitats within which they occur. Plant species are often referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there (Hall *et al.* 1997). Biological resources for this EA include vegetation, wildlife, and special-status species occurring on Malmstrom AFB in the vicinity of the proposed construction.

*Vegetation* includes all existing upland terrestrial plant communities and submerged aquatic vegetation with the exception of special-status species. The affected environment for vegetation includes those areas subject to construction disturbance. Wetlands are discussed in Section 3.3, *Soils and Water Resources*.

*Wildlife* includes all vertebrate animals with the exception of those identified as threatened or endangered or sensitive. Wildlife includes fish, amphibians, reptiles, birds, and mammals.

*Special-Status Species* are defined as those plant and animal species listed as threatened, endangered, or proposed as such by the USFWS. The federal ESA protects federally-listed, threatened, and endangered plant and animal species. Species of concern are not protected by the ESA; however, these species could become listed and protected at any time. Their consideration early in the planning process could avoid future conflicts that might otherwise occur. The discussion of special-status species focuses on those species with the potential to be affected by construction and construction-related noise.

### **3.4.1 Affected Environment**

The affected environment includes the location proposed for the AAFES Shopping Center construction. Those biological resources that may potentially be impacted by the proposed action are discussed in the following pages.



### ***Vegetation***

Little native vegetation currently exists on Malmstrom AFB. Over the years, native vegetation on lands within the base boundaries has been altered or modified by developmental activities and the introduction of exotic grasses. Most of the open fields on the southeast portion of the base have been plowed and planted to such introduced grasses as crested wheatgrass (*Agropyron cristatum*), Kentucky bluegrass (*Poa pratensis*), and intermediate wheatgrass (*Agropyron intermedium*). Bare ground requirements and regular mowing of installation grasses conducted as part of the hay lease and to satisfy bird/wildlife aircraft strike hazard requirements also have contributed to the present composition of range vegetation found on Malmstrom AFB. Introduced weedy forbs, including bracteate verbena (*Verbena bracteata*) and summer cypress (*Kochia scoparius*), have invaded the area, although some native grass species have recolonized sites to a small degree (Air Force 2008b).

### ***Wildlife***

Wildlife habitat is limited on the base by the relatively large portion of land used for buildings, runways, and other facilities. Open areas on base typically support a variety of introduced grasses and many open areas have been leased for hay production. 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. Transient use of the area by coyotes might occur. No native fish are located on base; the only large aquatic habitat on base, Pow Wow Pond, contains stocked rainbow trout (Air Force 2008b).

### ***Special-Status Species***

No federally-listed threatened or endangered species are known to exist on Malmstrom AFB. The Canada lynx (*Lynx canadensis*) and Gray wolf (*Canis lupus*) are special-status wildlife species in Cascade County that are federally-listed threatened and endangered respectively, by the USFWS (MNHP 2008). The peregrine falcon (*Falco peregrinus*) and bald eagle (*Haliaeetus leucocephalus*) have recently been delisted by the USFWS; however, the species remain under monitoring status. Habitat for these species is not present on Malmstrom AFB (Air Force 2008b). The ferruginous hawk (*Buteo regalis*) and the logger head shrike (*Lanius ludovicianus*), species identified as protected by the Montana Department of Fish, Wildlife and Parks (MDFWP), might migrate into or across Malmstrom AFB (Air Force 2008b). In 2001, Malmstrom AFB requested and received confirmation from the USFWS that no threatened or endangered plant species were present on Malmstrom AFB (Air Force 2008b).

## **3.4.2 Environmental Consequences**

Determination of the significance of potential impacts to biological resources is based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts to

biological resources are significant if species or habitats of concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of concern. Analysis of potential on-base impacts focuses on whether and how ground-disturbing activities and changes in the noise environment may affect biological resources.

### **Proposed Action**

Development at this location would have little impact to vegetation, wildlife, and special-status species. The proposed facility would be constructed on a previously disturbed site. No special-status species or potential habitats to support them are known or likely to occur on Malmstrom AFB, including the site proposed for construction. As such, no significant adverse impact to vegetation, wildlife, and special-status species would be expected from construction activities under the proposed action. The state-protected ferruginous hawk and loggerhead shrike may migrate into or across the base. Should either of these species be identified in the project site, the MDFWP would need to be consulted prior to the start of any construction activities. Because impacts are anticipated to be minor with the implementation of the proposed action, it is anticipated that vegetation and wildlife, would not be adversely affected. In the absence of special-status species on the base, no impact to this resource would be expected.

### **No-Action Alternative**

Under the no-action alternative, the AAFES Shopping Center on Malmstrom AFB would not be constructed at this time. No adverse impacts to vegetation, wildlife, or special-status species are anticipated through implementation of the no-action alternative.

## **3.5 CULTURAL RESOURCES**

Cultural resources are divided into three categories: archaeological resources, architectural resources, and traditional cultural resources or properties. Archaeological resources are places where people changed the ground surface or left artifacts or other physical remains (e.g., arrowheads or bottles). Archaeological resources can be classed as either sites or isolates and may be either prehistoric or historic in age. Isolates often contain only one or two artifacts, while sites are usually larger and contain more artifacts. Architectural resources are standing buildings, dams, canals, bridges, and other structures. Traditional cultural properties are resources associated with the cultural practices and beliefs of a living community that link that community to its past and help maintain its cultural identity. Traditional cultural properties may include archaeological resources, locations of historic events, sacred areas, sources of raw materials for making tools, sacred objects, or traditional hunting and gathering areas.

### **3.5.1 Affected Environment**

#### *Archaeological Resources*

Three archaeological sites adjacent to or on Malmstrom AFB property have been determined to be potentially eligible for the National Register of Historic Places (NRHP). These potentially eligible sites will be evaluated for NRHP eligibility when actions that have the potential to alter characteristics qualifying it for inclusion in or eligibility for the NRHP are proposed. None of the archaeological sites are located in the area proposed for the AAFES Shopping Center.

#### *Architectural Resources*

An intensive survey, inventory, and evaluation of the base and missile deployment area was conducted in 1996. The survey identified a number of buildings and facilities as potentially eligible for inclusion to the NRHP due to their Cold War significance. Subsequent to the survey, several of these resources have been formally determined by the Montana SHPO to be eligible for the NRHP. They include Building 1700, Missile Alert Facility Alpha-01 (MAF A-1), and Launch Facility Alpha-06 (LF A-6). As part of a Memorandum of Agreement with the Montana SHPO regarding the Deactivation of the 564<sup>th</sup> Missile Squadron, the Air Force has agreed all MAFs and LFs are eligible for inclusion to the NRHP. Building 165 was also evaluated by the Montana SHPO and determined not to be eligible for the NRHP. None of these facilities are located near the site proposed for construction of the AAFES Shopping Center.

#### *Traditional Cultural Properties*

To date, no traditional cultural properties or sacred sites have been identified on Malmstrom AFB.

### **3.5.2 Environmental Consequences**

For cultural resources, the threshold for significant impacts includes any disturbance that may affect the integrity of a historic property or a cultural resource whether or not it has been evaluated to determine its eligibility to the National Register. Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment by introducing visual or audible elements that are out of character for the period the resource represents, or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts are those that may occur as a result of the completed project, such as increased vehicular or pedestrian traffic in the vicinity of the resource.

#### **Proposed Action**

No impacts to archeological or architectural resources would be expected since none occur in the area of the proposed construction project. No impacts to cultural or traditional resources would be expected. The

base is not in possession of tribal human remains, funerary objects, sacred objects, or objects of cultural patrimony (personal communication, Hedlund 2008). However, in the event that archaeological resources are discovered during any construction activity, Malmstrom AFB would implement the standard Air Force procedures in AFI 32-7065, *Cultural Resources Management Program* for unanticipated archaeological discoveries and notification.

### **No-Action Alternative**

Under the no-action alternative, no ground disturbance from proposed construction activities would occur. The AAFES Shopping Center would not be constructed; therefore, no changes to the existing conditions of cultural resources on Malmstrom AFB would occur as a result of the no-action alternative.

## **3.6 SOCIOECONOMICS**

Socioeconomics is defined as the social and economic activities associated with the human environment, particularly population and economic activity. Economic activity typically includes employment, personal income, and industrial growth. Socioeconomics for this EA focus on the general features of the local economy that could be affected by the proposed action or no-action alternative.

### **3.6.1 Affected Environment**

The affected environment for this analysis includes Cascade County which surrounds Malmstrom AFB and in which most socioeconomic effects would be experienced. Comparison of the affected region to conditions for the State of Montana will also be presented.

**Population.** The city of Great Falls is the seat of Cascade County and accounts for approximately 70 percent of the county population. The population of Cascade County experienced a decrease of approximately 1 percent from 2000 to 2006 with an estimated 79,385 persons in 2006. By comparison, the population of the State of Montana increased by 4.5 percent during the same period, reaching 944,632 in 2006 (USCB 2006).

**Employment and Earnings.** In the affected region, total full- and part-time employment decreased 1.6 percent from 40,135 jobs in 2000 to 39,513 jobs in 2006 which reflected the population decrease over the same period. The largest contributions to Cascade County employment in 2006 were made by educational and health services (36 percent) and retail (12 percent) which compared strongly with the State of Montana at 32 percent and 12 percent, respectively (USCB 2006).

Malmstrom AFB provides significant economic benefit to the local community. In 2007, Malmstrom AFB had 3,456 active-duty military and 1,332 civilian workers (Air Force 2008c). In addition to the nearly \$215 million in personnel payroll expenditures, the base also purchased considerable quantities of

goods and services from local and regional firms. Construction costs; service contracts; and materials, supplies, and equipment for the base totaled over \$110 million in 2007. Further, the Air Force estimates that the economic stimulus of Malmstrom AFB created approximately 1,575 secondary jobs in the civilian economy generating approximately \$45 million to the local region. In total, Malmstrom AFB contributed over \$370 million to the local economy in 2007 (Air Force 2008c).

### **3.6.2 Environmental Consequences**

The threshold level of significance for socioeconomics for this analysis consists of a combination of several factors, to include unusual population growth or reduction, unusual increase/decrease in demands on housing and public services, and the potential to substantially increase/decrease employment opportunities.

#### **Proposed Action**

Construction associated with the AAFES Shopping Center would take approximately 17 months with cost estimates of about \$8.5 million. It is estimated that 25-30 workers would be employed at any one time during construction. Workers would likely commute from the surrounding area to Malmstrom AFB on a short-term basis. It is probable that local construction companies would be contracted to build the AAFES Shopping Center with the majority of the construction materials purchased outside the local region and transported to the site. A small, short-term beneficial impact would be expected; however, when compared with development projects for the base and the region, the economic impacts would be easily absorbed and have very minimal effect to the local socioeconomic environment.

#### **No-Action Alternative**

Socioeconomic resources would not be affected by implementation of the no-action alternative. Impacts to this resource would not be expected since baseline conditions would remain unchanged.

### **3.7 LAND MANAGEMENT AND USE**

Land use generally refers to human modification of land, often for residential or economic purposes. It also refers to the use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. Human land uses include residential, commercial, industrial, agricultural, and recreation. Unique natural features are often designated as national or state parks, forests, wilderness areas, or wildlife refuges.

Attributes of land use include general land use and ownership, land management plans, and special use areas. Land ownership is a categorization of land according to the type of owner. Major land ownership categories include federal, state, American Indian, and private. Federal lands are further defined by the

managing agency, which may include the USFWS, USFS, or the Department of Defense (DoD). Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of activities that are allowed or that protect specially designated or environmentally sensitive uses.

### **3.7.1 Affected Environment**

Malmstrom AFB includes developed and undeveloped lands. Main categories of developed land uses include airfield or direct mission areas; industrial support areas; administrative services areas; and housing, recreation, and services areas. Undeveloped lands are commonly called open space in planning documents and may include natural or cultural resource preservation sites, safety buffers, or other similar land uses. The proposed location for construction of the AAFES Shopping Center is undeveloped land classified as Open Space (Figure 3.5).

### **3.7.2 Environmental Consequences**

The threshold level of significance for land management and use is the potential for the proposed action and alternatives to change the land use in such a manner as to cause incompatibility with adjacent land management and/or uses. The Malmstrom AFB General Plan (Air Force 2002) indicates the existing land use designation for the proposed site is Open Space. Implementation of the proposed action would require a land use designation to Community Commercial.

#### **Proposed Action**

Construction of the AAFES Shopping Center at the proposed site would not be consistent with the current Open Space land use. Proper environmental permitting (i.e., zoning waiver) would be secured before construction took place. Changing the land use from Open Space to Community Commercial would not be expected to have an adverse impact to this resource.

#### **No-Action Alternative**

Under this alternative, a zoning waiver would not be required since the AAFES Shopping Center would not be constructed on Malmstrom AFB at this time. The existing Open Space land use designation would remain unchanged with implementation of the no-action alternative.

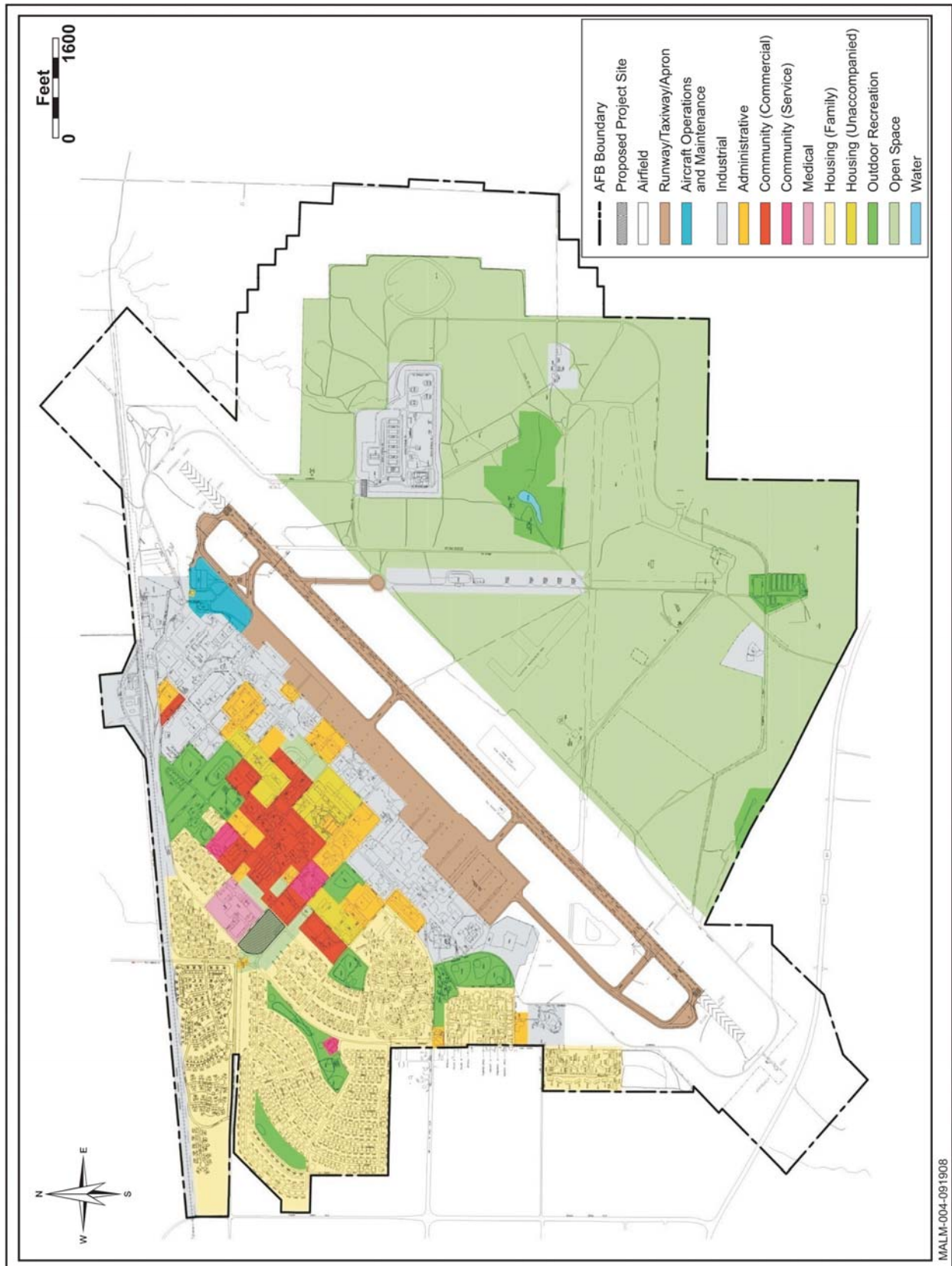


Figure 3.5 Existing Malmstrom AFB Land Use Designations

### 3.8 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation and Liability Act; the Occupational Safety and Health Act; and the Emergency Planning and Community Right-to-Know-Act. Resource Conservation and Recovery Act defines hazardous waste as any solid, liquid, contained gaseous or semisolid waste, or any combination of waste that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitability, or corrosiveness. In addition, certain types of waste are “listed” or identified as hazardous in 40 CFR Part 261. Executive Order 12088, *Federal Compliance with Pollution Control Standards*, ensures that necessary actions are taken for the prevention, management, and abatement of environmental pollution from hazardous materials or hazardous waste due to federal activities. Other topics commonly addressed under hazardous materials and waste includes USTs and potential contaminated sites designated under the Air Force’s Installation Restoration Program (IRP). Solid waste management refers to the disposal of materials from the demolition of existing facilities.

The majority of hazardous materials used by the Air Force and contractor personnel at Malmstrom AFB are controlled through an Air Force pollution prevention process called HAZMART. This process provides centralized management of the procurement, handling, storage, and issuing of hazardous materials and turn-in, recovery, reuse, recycling, or disposal of hazardous materials. The HAZMART process includes review and approval by Air Force personnel to ensure users are aware of exposure and safety risks.

#### 3.8.1 Affected Environment

##### *Hazardous Materials and Waste*

Operations at Malmstrom AFB require the use and storage of many hazardous materials. These materials include flammable and combustible liquids, acids, corrosives, caustics, anti-icing chemicals, compressed gases, solvents, paints, paint thinners, pesticides, petroleum hydrocarbons, hydraulic fluids, and fire retardant. The Malmstrom AFB *Hazardous Waste Management Plan* (HWMP) specifies protocols for storage locations on the base and proper handling procedures for all hazardous substances (Air Force 2007). The USEPA has authorized the State of Montana to enforce RCRA regulations in the state as set forth in Title 17, Chapter 54 and Administrative Rules of Montana. Hazardous waste at Malmstrom AFB is regulated through the Montana DEQ Hazardous Waste Permit Number MTHWP-01-01. Protocols described in the Malmstrom AFB’s HWMP include spill detection, spill reporting, spill containment, decontamination, and proper cleanup and disposal methods. In keeping with the requirements outlined in the Malmstrom AFB HWMP, hazardous waste is properly segregated, stored, characterized, labeled, and packaged for collection at a designated initial satellite accumulation point. The base has approximately 16 waste accumulation points at work locations. Base personnel transport the waste from the satellite accumulation points to the central 90-day Hazardous Waste Storage Area (HWSA). There, the wastes are



stored until disposal is economically practicable or before 90 days has expired, whichever comes first. Environmental Management Incorporated is under contract with the base to pick up the wastes and transport them off base for disposal in a licensed disposal facility.

### ***Solid Waste***

Solid wastes generated at the base are disposed of at High Plains Sanitary Landfill, located approximately 10 miles from the base in Great Falls. There are no active landfills on Malmstrom AFB (Air Force 2003).

### ***Installation Restoration Program***

The IRP is the process by which contaminated sites and facilities are identified and characterized and by which existing contamination is contained, removed, and disposed of to allow for beneficial reuse of the property. IRP sites include underground waste fuel storage areas (e.g., oil/water separators) and maintenance-generated wastes. Compliance activities for IRP sites address USTs, hazardous materials management, closure of active sites, polychlorinated biphenyls, water discharges, and other compliance projects that occur on or near IRP sites. Figure 3.6 provides the location of active IRP sites on the base (Air Force 2008d).

## **3.8.2 Environmental Consequences**

The significance of potential impacts associated with hazardous materials and wastes is based on the toxicity, transportation, storage, and disposal of these substances. Hazardous materials and hazardous waste impacts are considered significant if the storage, use, transportation, or disposal of these substances substantially increases the human health risk or environmental exposure. An increase in the quantity or toxicity of hazardous materials and/or hazardous waste handled by a facility may also signify a potentially significant impact, especially if a facility was not equipped to handle the new waste streams.

### **Proposed Action**

#### ***Hazardous Materials and Waste***

Construction of the AAFES Shopping Center may require the use of hazardous materials such as paints, adhesives, and batteries by construction personnel. In accordance with the base's HAZMART procedure, copies of Material Safety Data Sheets must be provided to the base and maintained on the construction site. Construction personnel would comply with federal, state, and local environmental laws and would employ affirmative procurement practices when economically and technically feasible. Storage and use of hazardous materials would continue to be part of the daily activities of the AAFES Shopping Center.

The amounts and types of hazardous wastes generated by base personnel during the operation and maintenance of the Shopping Center is not anticipated to change. Construction of the AAFES Shopping Center would include the installation of two 15,000-gallon double walled USTs with the appropriate

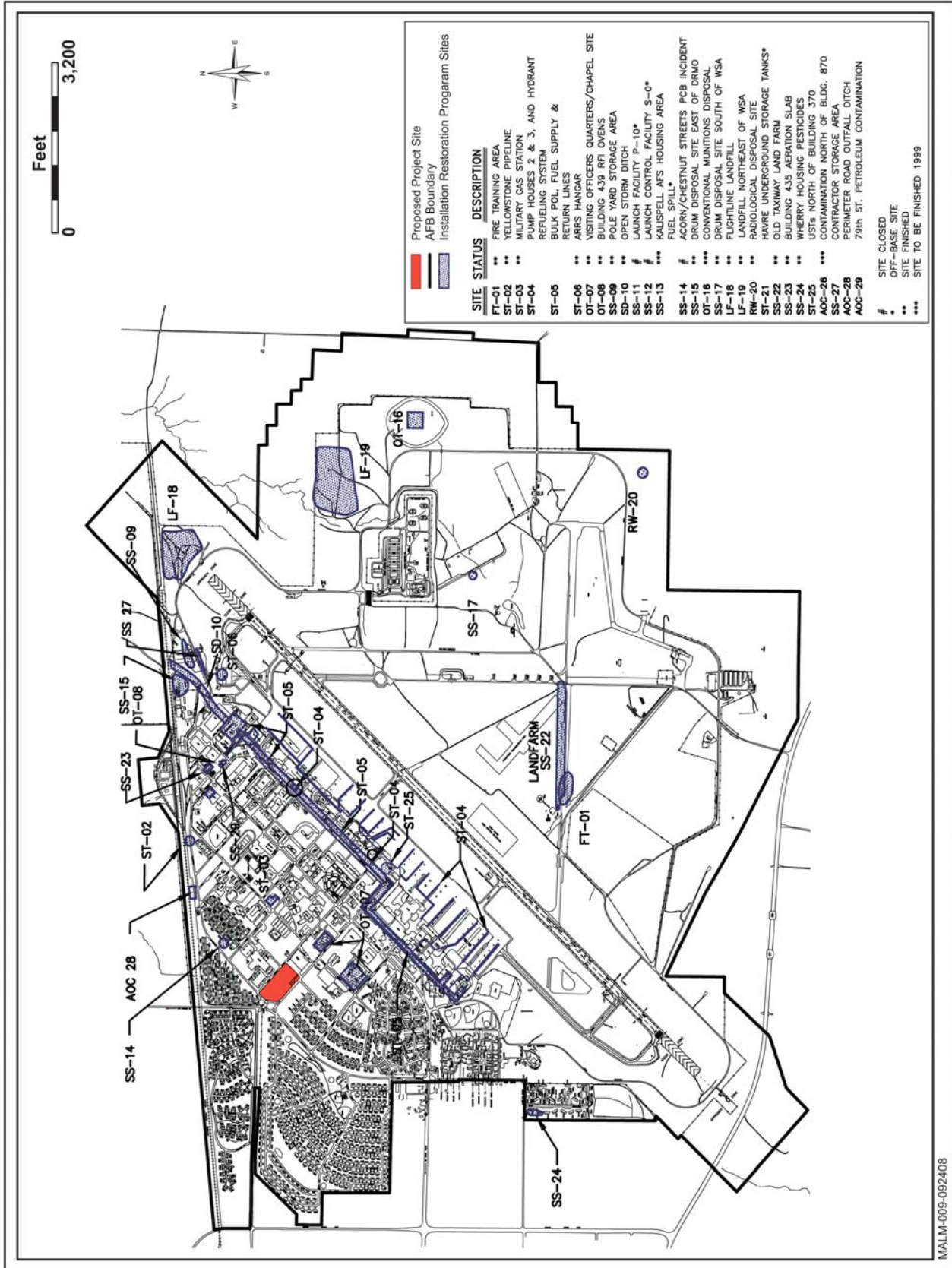


Figure 3.6 Location of IRP Sites on Malmstrom AFB

vapor recovery systems. A permit would be obtained from the Montana DEQ for this petroleum activity. The USTs would be installed in accordance with state and federal regulations and would be registered with the Montana DEQ within 30 days of installation. No adverse environmental impacts related to hazardous materials and waste would be expected under the proposed action.

***Solid Waste***

Construction debris materials that would not be suitable for recycling would be transported to a landfill permitted to handle construction debris waste. Operation of the AAFES Shopping Center would generate solid waste; however, no adverse consequences to this resource would be expected.

***Installation Restoration Program***

The location proposed for construction of the AAFES Shopping Center is not near any IRP sites; therefore, no impact to the IRP would be anticipated.

**No-Action Alternative**

Under this alternative, the AAFES Shopping Center would not be constructed. The existing Base Exchange and gas station would continue to meet the needs of the base personnel and retirees. No changes to hazardous materials or waste management would be expected. In addition, no change to the base's IRP would occur.

## **CHAPTER 4**

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

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## **CHAPTER 4**

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

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### **4.1 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 Part 1508.7). Assessing cumulative effects involves defining the scope of the other actions and their interrelationship with the proposed action and alternatives, if they overlap in space and time.

Cumulative effects are most likely to arise when a proposed action is related to other actions that occur in the same location or at a similar time. Actions geographically overlapping or close to the proposed action would likely have more potential for a relationship than those farther away. Similarly, actions coinciding in time with the proposed action would have a higher potential for cumulative effects.

To identify cumulative effects, three fundamental questions need to be addressed:

1. Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If one or more of the affected resource areas 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, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

### **4.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS**

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time in which the effects could occur. Since the potential impacts of the proposed action include Malmstrom AFB and its vicinity, the cumulative effects analysis includes only those actions occurring within the affected region. The time frame for cumulative effects centers on implementation of the proposed action. Construction of the AAFES Shopping Center would likely commence in early 2009. Another factor influencing the scope of cumulative effects analysis involves identification and consideration of other actions. For the purpose of this analysis, public documents prepared by federal, state, and local government agencies were the primary sources of information for identifying reasonable foreseeable actions. Documents used to define other actions included EAs, management plans, and land use plans.

#### **4.2.1 Past , Present, and Future Actions**

Malmstrom AFB is an active military installation that undergoes continuous change in mission and 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 AFB was in 1997 when the 819<sup>th</sup> RED HORSE was assigned to Malmstrom AFB. On May 16, 2005 the DoD released a Base Realignment and Closure (BRAC) list. Under the 2005 BRAC, Malmstrom AFB will acquire a U.S. Army Reserve Center. The action will require facility construction (to be analyzed in a separate environmental document) at a proposed 9-acre site on the southeast side of the base. It is anticipated that the proposed site would drain to the south and stormwater would exit on the southeast side of the runway.

Numerous projects have been completed or are in progress at the base, including facility improvements and infrastructure upgrades. In the past 6 years, the completed upgrades to the Corrosion Control Facility, Heating Plant, and Phases I-V of the base housing project have occurred. In addition, a stormwater detention basin was constructed near Outfall 1 to reduce stormwater runoff during peak flow events that send water discharged from Drainage Area 1 into the Whitmore Ravine. Facility improvement projects that are currently underway include continued upgrades of the base housing (Phases VI through VII), construction of a new fitness center and a new stormwater detention pond at stormwater Outfall 3 in Drainage Area 3.

In 2008, Malmstrom AFB reviewed and approved the 2002 Malmstrom AFB General Plan, which identified areas on the base where existing missions could be expanded and where new missions could be located (Air Force 2002). The weapons storage area is slated for upgrades. Environmental analysis for a new Community Activity Center is currently being conducted. No known future projects, other than construction of the AAFES Shopping Center, are currently proposed for the installation.

#### **4.2.2 Analysis of Cumulative Impacts**

Analysis showed the AAFES Shopping Center proposal when considered with past, present, and/or future actions would not result in any adverse and/or significant impacts to air quality; soils and water resources; biological resources; cultural resources; socioeconomics; land management and use; or hazardous materials and waste management.

**Air Quality.** Impacts to air quality would be short-term and limited to the localized area. Prolonged construction activity, such as the Malmstrom AFB housing upgrade and the construction of the AAFES Shopping Center could conceivably impact regional air quality attainment status; however, it is unlikely that implementation of the proposed action, in addition to current actions, would result in long-term air quality degradation.

**Soils and Water Resources.** The potential exists for short term increases in sediment discharge during construction activity; however, best management practices, would be implemented to control erosion as required under the MPDES Construction Storm Water Discharge Permit regulations. The construction permit would establish appropriate stormwater control measures that would be designed to prevent any significant short term impacts.

The AAFES project site is within Drainage Area 2. While implementing the proposed action would increase the amount of impervious area in the drainage area by 4.4 acres, Malmstrom AFB would ensure that construction design plans include stormwater retention for 100 percent of the difference between pre-development and post-development for both a 10-year, 2-hour storm event and 10-year, 24-hour storm event using Low Impact Design (LID) development or on-site retention. The current design exceeds the calculated required storage capacity for a 10-year, 24-hour storm event. Implementation of LID and the small change in impervious area that would result from the proposed development in Drainage Area 2 lead to a determination of no adverse change to the pre-existing surface water conditions at Malmstrom AFB.

No cumulative impacts to groundwater recharge or surface water resources would be expected when combined with current development (i.e., Fitness Center) in Drainage Area 2. Consideration of the proposed action with present development would not significantly alter the current condition of the channel of Drainage Area 2 or Outfall 2. The actions would not significantly alter any existing condition of sheet or channel flow currently existing in Drainage Area 2. No significant changes in cumulative environmental impacts to surface water are expected from the implementation of the proposed or present action. In summary, no significant cumulative impacts to ground or surface water would be anticipated as a result of the proposed action when considered with present construction in Drainage Area 2.

**Biological Resources.** No threatened or endangered species are known to occur on the base. Cumulative impacts could occur if land that supports threatened and/or endangered species were removed or disturbed; however, the site proposed for construction does not possess these attributes. When considered cumulatively with other actions on the base, the proposed action would not create significant impacts to biological resources.

**Cultural Resources.** To date, no traditional cultural resources have been identified on Malmstrom AFB. In the event that archaeological resources are encountered during construction, the base would implement the standard Air Force procedures in AFI 32-7065, *Cultural Resources Management Program* for unanticipated archaeological discoveries and notification. No significant cumulative impacts are anticipated.

**Socioeconomics.** Construction activities associated with the projects would temporarily generate construction income and thus result in a temporary beneficial impact; however, when considered



cumulatively, socioeconomic impacts associated with this proposal when considered with other past, present, and reasonably foreseeable projects would be negligible.

**Land Management and Use.** The land use designation would need to be changed from Open Space to Community Commercial prior to implementation of the proposed action; however, no adverse impact to land use on the installation would be anticipated. The AAFES Shopping Center construction would be consistent with current and proposed design standards and, therefore, no significant cumulative impacts would result.

**Hazardous Materials and Waste Management.** Compliance with applicable regulations protecting human health and regulating waste management of construction debris as well as implementation of best management practices during construction would reduce potential cumulative impacts to less than significant levels.

#### **4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

NEPA requires that environmental analysis include identification of any irreversible and irretrievable commitment 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 this use could 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. Irretrievable 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 disturbance of a cultural resource).

For the proposed action, most resource commitments are neither irreversible nor irretrievable. Most environmental consequences are short-term and temporary, such as air emissions from construction operations. The AAFES Shopping Center proposal would require consumption of limited amounts of materials typically associated with construction (wood, metal, asphalt, and fuel). However, the amount of these materials used is not expected to significantly decrease the availability of these resources either locally or globally. Based on the analysis in this EA, implementation of the proposed action would not result in adverse impacts to the environment or to the health and safety of persons in the affected region.

## **CHAPTER 5**

### **REFERENCES CITED**

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## CHAPTER 5

### REFERENCES CITED

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# **CHAPTER 6**

## **PERSONS AND AGENCIES CONTACTED**

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## **CHAPTER 6**

### **PERSONS AND AGENCIES CONTACTED**

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Baumler, Dr. Mark. SHPO. Montana State Historic Preservation Office. October.

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Cox, Allen. Montana National Heritage Program. October.

Opper, Richard. Director. Montana Department of Environmental Quality. October.

Wilson, Mark. Field Supervisor. USFWS Montana Field Office. October.



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## **CHAPTER 7**

# **LIST OF PREPARERS AND CONTRIBUTORS**

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## CHAPTER 7

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# **APPENDIX A**

## **INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING CORRESPONDENCE**

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


**OCT 02 2008**

MEMORANDUM FOR: Mr. Richard Opper, Director  
Montana Department of Environmental Quality  
PO Box 200901  
Helena MT 59620-0901

FROM: 341 CES/CEAO  
39 78<sup>th</sup> Street North  
Malmstrom AFB MT 59402-7536

SUBJECT: Proposed Construction of an AAFES Shopping Center, Malmstrom Air Force Base  
(MAFB) Montana

1. MAFB is preparing an Environmental Assessment (EA) for the proposed construction of an AAFES Shopping Center within the boundaries of MAFB. The EA will analyze one location for the proposed facility (Atch 1).
2. The EA will evaluate potential environmental effects resulting from the proposed construction of a 40,000-square foot facility, four vehicle gasoline pumps, and a 160-space parking lot. The EA will also examine the potential cumulative impacts from other past, present, and reasonably foreseeable future proposals.
3. Please contact 2d Lt. Christopher Brown, EA Project Manager, Malmstrom AFB at (406) 731-6438 with any questions or concerns.

  
CHRISTOPHER K. BROWN, 2d Lt, USAF  
Chief, Asset Optimization

1 Attachment  
Map of Proposed Site





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


MEMORANDUM FOR: Mr. Mark Wilson  
U.S. Fish and Wildlife Service  
Montana Field Office  
585 Shepard Way  
Helena MT 59601

**OCT 02 2008**

FROM: 341 CES/CEAO  
39 78<sup>th</sup> Street North  
Malmstrom AFB MT 59402-7536

SUBJECT: Proposed Construction of an AAFES Shopping Center, Malmstrom Air Force Base  
(MAFB) Montana

1. MAFB is preparing an Environmental Assessment (EA) for the proposed construction of an AAFES Shopping Center within the boundaries of MAFB. The EA will analyze one location for the proposed facility (Atch 1). The purpose of the proposal is to evaluate potential environmental effects resulting from the proposed construction of a 40,000-square foot facility, four vehicle gasoline pumps, and a 160-space parking lot. The EA will also examine the potential cumulative impacts from other past, present, and reasonably foreseeable future proposals.
2. This EA will analyze the potential effects of this proposed action on environmental resources. Pursuant to the Endangered Species Act and the National Environmental Policy Act, we request information regarding federally listed or proposed species that may be present in the potentially affected area. We would appreciate receiving the information in digital format, if available. We will contact you at a later date to determine the need for a Section 7 consultation. We anticipate a draft EA will be made available for public and agency comment in December 2008.
3. Our contractor for this project is TEC Inc and we would appreciate your cooperation during their data collection efforts.
4. Please contact the EA Project Manager, 2d Lt. Christopher Brown at Malmstrom AFB, (406) 731-6438 with any questions or concerns.

  
CHRISTOPHER K. BROWN, 2d Lt, USAF  
Chief, Asset Optimization

1 Attachment  
Map of Proposed Site



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


MEMORANDUM FOR: Mr. Gary Bertellotti, Regional Supervisor  
Montana Department of Fish, Wildlife, and Parks  
4600 Giant Springs Road  
Great Falls MT 59405

**OCT 02 2008**

FROM: 341 CES/CEAO  
39 78<sup>th</sup> Street North  
Malmstrom AFB MT 59402-7536

SUBJECT: Proposed Construction of an AAFES Shopping Center, Malmstrom Air Force Base  
(MAFB) Montana

1. MAFB is preparing an Environmental Assessment (EA) for the proposed construction of an AAFES Shopping Center within the boundaries of MAFB. The EA will analyze one location for the proposed facility (Atch 1).
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3. Please contact 2d Lt. Christopher Brown, EA Project Manager, Malmstrom AFB at (406) 731-6438 with any questions or concerns.

  
CHRISTOPHER K. BROWN, 2d Lt, USAF  
Chief, Asset Optimization

1 Attachment  
Map of Proposed Site



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


MEMORANDUM FOR: Dr. Mark Baumler  
Montana State Historic Preservation Office (SHPO)  
1410 8<sup>th</sup> Avenue  
Helena MT 59620-1202

**OCT 02 2008**

FROM: 341 CES/CEAO  
39 78<sup>th</sup> Street North  
Malmstrom AFB MT 59402-7536

SUBJECT: Proposed Construction of an AAFES Shopping Center, Malmstrom Air Force Base  
(MAFB) Montana

1. MAFB is preparing an Environmental Assessment (EA) for the proposed construction of an AAFES Shopping Center within the boundaries of MAFB. The EA will analyze one location for the proposed facility (Atch 1).
2. We will use information collected for the EA to consider any impacts on historic properties identified. This information will be coordinated with your office according to the steps outlined in 36 CFR 800.7. We anticipate a draft EA will be made available for public and agency comment in December 2008.
3. Our contractor for this project is TEC Inc and we would appreciate your cooperation during their data collection efforts.
4. Please contact the EA Project Manager, 2d Lt. Christopher Brown at Malmstrom AFB, (406) 731-6438 with any questions or concerns.

  
CHRISTOPHER K. BROWN, 2d Lt, USAF  
Chief, Asset Optimization

1 Attachment  
Map of Proposed Site



United States Department of the Interior  
Fish and Wildlife Service



Ecological Services  
Montana Field Office  
585 Shepard Way  
Helena, Montana 59601-6287  
Phone: (406) 449-5225 Fax: (406) 449-5339

10/08/2008

2<sup>nd</sup> Lt. Christopher K. Brown  
Chief, Asset Optimization  
United States Air Force  
341 CES/CEAO  
39 78<sup>th</sup> Street North  
Malmstrom AFB 59402-7536

Dear Lieutenant Brown:

We have reviewed the project outline and maps submitted to us on October 02, 2008, regarding the proposed construction of a new shopping center at Malmstrom AFB, near Great Falls, Montana. Our determination is that this project is unlikely to have any significant adverse effects upon fish, wildlife, or habitat resources under the purview of the U.S. fish and Wildlife Service.

Please telephone me at 406/449-5225, ext. 205, if you have any questions regarding this matter.

Sincerely,

R. Mark Wilson  
Field Supervisor



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES  
MONTANA FIELD OFFICE  
585 SHEPARD WAY  
HELENA, MONTANA 59601  
PHONE (406) 449-5225, FAX (406) 449-5339

File: M10 (I)

February 17, 2009

John Y. Kim, 2d Lt, USAF  
Environmental Planner  
341 CES/CEAON  
39 78th Street North  
Malmstrom AFB, MT 59402

Dear Mr. Kim:

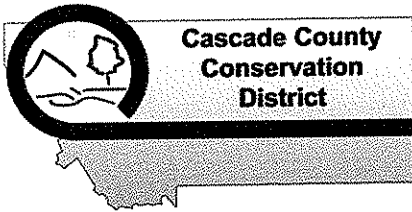
This is in response to your request received on February 9, 2009 for U.S. Fish and Wildlife Service (Service) review and comments regarding the draft Environmental Assessment for the proposed construction of a shopping center on Malmstrom Air Force Base, Montana. We appreciate the opportunity to review this project proposal and provide comments. These comments have been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and the Endangered Species Act (16 U.S.C. 1531 et. seq.).

Considering the location of the proposed action, the Service does not anticipate the occurrence of any federally listed threatened, endangered, candidate or proposed species. The project is not likely to have any significant effects on fish, wildlife or habitat resources under the purview of the Service. There may be state species of concern in the vicinity of the project and we recommend contacting the Montana Department of Fish, Wildlife and Parks at 1420 East Sixth Ave., P.O. Box 200701, Helena, MT 59620-0701, 406-444-2535 or the Montana Natural Heritage Program, 1515 East 6<sup>th</sup> Avenue, Box 201800, Helena, MT 59620-1800, 406-444-5354.

The Service appreciates your efforts to incorporate fish and wildlife resource concerns, including threatened and endangered species, into your project planning. If you have questions or comments related to this issue, please contact Katrina Dixon at 406-449-5225 extension 222.

Sincerely,

R. Mark Wilson  
Field Supervisor



## LOCAL COMMON SENSE CONSERVATION

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12 Third Street NW, Suite 300  
Great Falls, Montana 59404  
Email: [cccd@3rivers.net](mailto:cccd@3rivers.net)

Fax: 406-727-4810  
406-727-3603, ext. 125  
[www.cascadecd.org](http://www.cascadecd.org)

February 17, 2009

John Y. Kim, 2<sup>nd</sup> Lt, USAF  
341 CES/CEAON  
39 78<sup>th</sup> Street N  
Malmstrom AFB, Montana 59402

Dear Second Lieutenant Kim:

The Cascade County Conservation District (CCCD) has received the AAFES Shopping Center Environmental Assessment Draft. First off, we wish to thank you for including us in your request for comments and questions on the project.

The staff of the CCCD has reviewed the EA and finds it to be satisfactory. We are encouraged by your use of stormwater basins to capture the stormwater runoff of the impervious surfaces. These retention ponds and filtration systems, we agree will reduce the stormwater runoff to negligible levels. As you may know, we are concerned about the flows that may make their way to the outfalls 1 & 2 of the west fork of Whitmore Ravine. It looks like you have taken steps to elevate that flow with the use of the ponds.

Please keep us informed of any and all changes to this project. We look forward to hearing from you as this project comes to fruition. Once again thank you for including us in this process.

Respectfully,

Richard Gasvoda, Chairman  
Cascade County Conservation District

**DRAFT ENVIRONMENTAL ASSESSMENT  
AAFES Shopping Center, Malmstrom AFB**

**Distribution List**

Cascade County Conservation District  
#12 Third Street NW  
Great Falls, Montana 59405

City of Great Falls  
City/County Planning Board  
#2 Park Drive South  
Great Falls, Montana 59403

Montana Department of Environmental Quality  
Metcalf Building  
1520 E. 6th Avenue  
Helena, Montana 59620  
Mr. Richard Opper, Director

Montana Department of Fish, Wildlife, and Parks  
Region 4  
4600 Giant Springs Road  
Great Falls, Montana 59405  
Mr. Graham Taylor, Regional Supervisor (Acting)

State Historic Preservation Office  
1410 8th Avenue  
Helena, Montana 59620  
Dr. Mark Baumler, SHPO

U.S. Fish and Wildlife Service  
Ecological Services, Montana Field Office  
585 Shepard Way  
Helena, Montana 59601  
Mr. Mark Wilson, Field Supervisor

## **APPENDIX B**

# **AIR QUALITY ANALYSIS**

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# APPENDIX B

## AIR QUALITY ANALYSIS

As described in Section 3.2, air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. These standards (Table B-1) represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

The air quality analysis in this EA examined impacts from air emissions associated with the proposed action. As part of the analysis, emissions generated from construction equipment, motor vehicles, and other area (nonmobile) sources were examined for carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>x</sub>), ozone (in the form of volatile organic compounds VOCs), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Cascade County is classified as “better than national standards” for SO<sub>2</sub> and “cannot be classified or better than national standards” for NO<sub>2</sub>. Cascade County is designated as “unclassifiable/attainment” for PM<sub>2.5</sub> and O<sub>3</sub>, “unclassifiable” for PM<sub>10</sub>, and is designated as “attainment” (in 2002) for CO.

**Table B-1 Montana and National Ambient Air Quality Standards**

POLLUTANT <sup>a</sup>	AVERAGING TIME	MONTANA <sup>b</sup>	NATIONAL PRIMARY	NATIONAL SECONDARY
Ozone (O <sub>3</sub> )	8 Hours	---	0.75 ppm <sup>c</sup>	Same as Primary
	1 Hour	0.10 ppm	---	---
Carbon Monoxide (CO)	8 Hours	9.0 ppm	9.0 ppm	None
	1 Hour	23 ppm	35 ppm	
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Arithmetic Mean	0.053 ppm	0.053 ppm	Same as Primary
	1 Hour	0.30 ppm	---	---
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	0.02 ppm	0.03 ppm	None
	24 Hours	0.10 ppm	0.14 ppm	
	3 Hours		---	0.50 ppm
	1 Hour	0.50 ppm	---	---
Particulate Matter (PM <sub>10</sub> )	24 Hours		150 µg/m <sup>3</sup> <sup>b</sup>	Same as Primary
Particulate Matter (PM <sub>2.5</sub> )	Annual		15 µg/m <sup>3</sup>	Same as Primary
	24 Hours		65 µg/m <sup>3</sup>	---
Lead (Pb)	Quarterly Arithmetic Mean		1.5 µg/m <sup>3</sup>	Same as Primary
Settled Particulate Matter	30-Day	10 g/m <sup>2</sup>	--	--
Fluoride in Forage	Monthly Average	50 µg/g	--	--
	Grazing Season Average	35 µg/g	--	--

*Notes:*

<sup>a</sup> The National standards, other than for ozone and those based on annual averages, must not be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.

<sup>b</sup> To obtain specific information on the Montana standards, consult Administrative Rules of Montana, Chapter 8, Subchapter 2, Rule 17.8.

<sup>c</sup> ppm = parts per million by volume, µg/m<sup>3</sup> = micrograms per cubic meter, µg/g = microgram per gram, g/m<sup>2</sup> = grams per square meter.

## **CONSTRUCTION**

Air quality impacts from proposed construction activities were estimated from (1) combustion emissions due to the use of fossil fuel-powered equipment; (2) fugitive dust emissions (PM<sub>10</sub> and PM<sub>2.5</sub>) during demolition activities, earth-moving activities, and the operation of equipment on bare soil; and (3) VOC emissions from application of asphalt materials during paving operations.

Factors needed to derive the construction source emission rates were obtained from *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling* (USEPA 2004a); *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition* (USEPA 2004b); *Nonroad Engine and Vehicle Emission Study—Report* (USEPA 1991); *Exhaust Emission Factors for Nonroad Engine Modeling—Spark-Ignition* (USEPA 2004c); *Conversion Factors for Hydrocarbon Emission Components* (USEPA 2004d); *Comparison of Asphalt Paving Emission Factors* (CARB 2005); *WRAP Fugitive Dust Handbook* (WRAP 2004); *Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust* (MRI 2005) and *Mobile 6.2.03* (EPA 2003).

The analysis assumed that all construction equipment was manufactured before 2000. This approach is based on the well-known longevity of diesel engines, although use of 100% Tier 0 equipment may be somewhat conservative. The analysis also inherently reduced PM<sub>10</sub> fugitive dust emissions from earth-moving activities by 50 percent as this control level is included in the emission factor itself.

**Off-Road Equipment Emissions.** The NONROAD model (EPA 2005) is the EPA standard method for preparing emission inventories for mobile sources that are not classified as being related to on-road traffic, railroads, air traffic, or water-going vessels. As such, it is the starting place for quantifying emissions from construction-related equipment. The NONROAD model uses the following general equation to estimate emissions separately for CO, NO<sub>x</sub>, PM (essentially all of which is PM<sub>2.5</sub> from construction sources), and total hydrocarbons (THC), nearly all of which are nonmethane hydrocarbons:

$$EMS = EF * HP * LF * Act * DF$$

**Where:**

*EMS* = estimated emissions

*EF* = emissions factor in grams per horsepower hours

*HP* = peak horsepower

*LF* = load factor (assumed percentage of peak horsepower)

*Act* = activity in hours of operation per period of operation

*DF* = deterioration factor

The emissions factor is specific to the equipment type, engine size, and technology type. The technology type for diesel equipment can be “base” (before 1988), “tier 0” (1988 to 1999), or “tier 1” (2000 to 2005). Tier 2 emissions factors could be applied to equipment that satisfies 2006 national standards (or slightly

earlier California standards). The technology type for two-stroke gasoline equipment can be “base” (before 1997), “phase 1” (1997 to 2001), or “phase 2” (2002 to 2007). Equipment for phases 1 and 2 can have catalytic converters. For this study, all diesel equipment was assumed to be either tier 0 or tier 1 and all two-stroke diesel equipment was assumed to be phase 1 without catalytic converters.

The load factor is specific to the equipment type in the NONROAD model regardless of engine size or technology type, and it represents the average fraction of peak horsepower at which the engine is assumed to operate. NONROAD model default values were used in all cases. Because Tier 0 equipment was conservatively used throughout the analysis period (2009 to 2010), deterioration factors were not used to estimate increased emissions due to engine age. Based on the methodology described, it is possible to make a conservative estimate of emissions from off-road equipment if the types of equipment and durations of use are known.

**Fugitive Dust.** Emission rates for fugitive dust were estimated using guidelines outlined in the Western Regional Air Partnership (WRAP) fugitive dust handbook (WRAP 2004). The WRAP handbook offers several options for selecting factors for  $PM_{10}$  (coarse PM) depending on what information is known. After  $PM_{10}$  is estimated, the fraction of fugitive dust emitted as  $PM_{2.5}$  is estimated, the most recent WRAP study (MRI 2005) recommends the use of a fractional factor of 0.10 to estimate the  $PM_{2.5}$  portion of the  $PM_{10}$ . For site preparation activities, the emission factor was obtained from Table 3-2 of the WRAP Fugitive Dust Handbook. The areas of disturbance and approximate durations were used in conjunction with the large scale of land-disturbing activities occurring, resulting in the selection of the first factor with worst-case conditions for use in the analysis.

**$PM_{10}$ ,  $PM_{2.5}$ , and Mobile Sources.** Diesel exhaust is a primary, well-documented source of  $PM_{2.5}$  emissions. The vast majority of PM emissions in diesel exhaust is  $PM_{2.5}$ . Therefore, all calculated PM is assumed to be  $PM_{2.5}$ . A corollary result of this is that the  $PM_{10}$  fraction of diesel exhaust is estimated very conservatively as only a small fraction of  $PM_{10}$  is present in the exhaust. However, ratios of  $PM_{10}$  to  $PM_{2.5}$  in diesel exhaust are not yet published and therefore for the purposes of the EA calculations, all PM emissions are equally distributed as  $PM_{10}$  and  $PM_{2.5}$ .

**VOC Emissions from Paving.** VOC emissions from the application of hot mix asphalt were calculated throughout the construction period of 2009 to 2010. The estimates used asphalt volumes as provided in the Form 1391 (U.S. Air Force 2008), and used the published CARB hot mix asphalt emission factor.

**Construction Workers – Mobile Sources.** Mobile source emissions were calculated for construction workers for each of the construction years. For the construction workers, these emissions assumed that each worker drove their own car, and that the average mileage driven each workday within the AFB fenceline was 6 miles (to include driving during lunch break). Emission factors for construction workers were derived from the USEPA Mobile 6 mobile emissions model for each of the years 2009 - 2010.

**REFERENCES**

- Administrative Rules of Montana, Title 17, Montana Department of Environmental Quality, Chapter 8, Air Quality. Subchapter 2, Ambient Air Quality. March 31, 2007.
- California Air Resources Board (CARB). 2005. Comparison of Asphalt Paving Emission Factors.
- Midwest Research Institute (MRI). 2005. MRI Project No. 110397. Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust, conducted for the Western Governors Association Western Regional Air Partnership (WRAP). October.
- State of Montana Air Quality Control Implementation Plan. 2000. Great Falls Carbon Monoxide Limited Maintenance Plan. December 19.
- U.S. Air Force. 2008. Military Construction Project Data Form 1391. January 1.
- U.S. Environmental Protection Agency (USEPA). 2005. National Emission Inventory (NEI) database. Emissions by Category Report generated from the USEPA website at <http://www.epa.gov/air/data/> August.
- \_\_\_\_\_. 2004a. EPA Report No. NR-005c, Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling.
- \_\_\_\_\_. 2004b. EPA Report No. NR-009c, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition.
- \_\_\_\_\_. 2004c. EPA Report No. NR-010d, Exhaust Emission Factors for Nonroad Engine Modeling – Spark-Ignition. April.
- \_\_\_\_\_. 2004d. EPA 420-P-04-001, NR-002b, Conversion Factors for Hydrocarbon Emission Components. April.
- \_\_\_\_\_. 2003. Mobile 6.2.03, Mobile Source Emission Factor Model.
- \_\_\_\_\_. 1991. EPA 460/3-91-02, Nonroad Engine and Vehicle Emission Study – Report.
- Western Regional Air Partnership (WRAP). 2004. WRAP Fugitive Dust Handbook. November.

# AAFES Shopping Center EA

## Malmstrom AFB Shopping Center Construction - Air Emissions

Excavation 1,482 CY

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM	
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb	
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>											
2	Skid steer loader	2	4	15	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	2	10	23	4	2
	Dump truck (12 CY)	20	0.5	11	710	0.59	0.68	2.7	8.38	0.89	0.402	69	274	851	90	41
2	Backhoe/loader	2	8	11	98	0.21	0.99	3.49	6.9	0.85	0.722	8	28	55	7	6
	Small diesel engines	2	8	6	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	4	5	1	0
<b>Subtotal</b>											80	316	934	102	49	

Construct Shopping Center 40,267 SF

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM	
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb	
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>											
1	Grader	1	6	13	135	0.58	0.68	2.7	8.38	0.93	0.402	9	36	113	13	5
2	Skid steer loader	2	4	63	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	9	41	96	16	8
2	Backhoe/loader	2	6	50	98	0.21	0.99	3.49	6.9	0.85	0.722	27	95	188	23	20
	Small diesel engines	1	4	38	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	6	8	1	1
	Dump truck	6	1	17	275	0.21	0.68	2.7	8.38	0.89	0.402	9	35	109	12	5
<b>Subtotal</b>											55	213	513	64	39	

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM	
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb	
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>											
	Small diesel engines	2	4	34	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	2	11	13	2	1
	Delivery truck	1	2	40	180	0.21	0.68	2.7	8.38	0.89	0.402	5	18	56	6	3
2	Skid steer loader	2	4	134	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	19	86	204	34	17
	Concrete truck	8	1	63	250	0.21	0.68	2.7	8.38	0.89	0.402	40	158	489	52	23
1	Crane	1	8	21	120	0.43	0.3384	0.8667	5.6523	0.93	0.2799	6	17	108	18	5
<b>Subtotal</b>											72	289	870	112	50	

Concrete Work 470 CY

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM	
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb	
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>											
1	Skid steer loader	1	4	18	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	1	6	14	2	1
	Concrete truck (9 CY)	3	1	22	250	0.21	0.68	2.7	8.38	0.89	0.402	5	21	64	7	3
	Dump truck (12 CY)	2	0.5	8	275	0.21	0.68	2.7	8.38	0.89	0.402	1	3	9	1	0
	Delivery truck	1	1	8	180	0.21	0.68	2.7	8.38	0.89	0.402	0	2	6	1	0
1	Backhoe/loader	1	4	15	98	0.21	0.99	3.49	6.9	0.85	0.722	3	10	19	2	2
<b>Subtotal</b>											10	40	111	13	7	

Grading 38,457 SY

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM	
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb	
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>											
1	Grader	1	4	5	135	0.58	0.68	2.7	8.38	0.93	0.402	2	9	29	3	1
2	Skid steer loader	2	4	18	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	3	12	27	5	2
2	Backhoe/loader	2	6	14	98	0.21	0.99	3.49	6.9	0.85	0.722	8	27	53	6	6
	Small diesel engines	1	4	18	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	3	4	1	0
	Dump truck	6	1	9	275	0.21	0.68	2.7	8.38	0.89	0.402	5	19	58	6	3
<b>Subtotal</b>											18	69	170	21	12	

# AAFES Shopping Center EA

## Malmstrom AFB Shopping Center Construction - Air Emissions (continued)

Gravel Work 6,410 CY

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>										
1 Grader	1	4	58	135	0.58	0.68	2.7	8.38	0.93	0.402	27	108	336	37	16
2 Skid steer loader	2	6	54	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	11	52	123	20	10
2 Backhoe/loader	2	6	54	98	0.21	0.99	3.49	6.9	0.85	0.722	29	103	203	25	21
Small diesel engines	3	4	58	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	5	27	35	6	3
Dump truck (12 CY)	10	0.5	54	275	0.21	0.68	2.7	8.38	0.89	0.402	23	93	288	31	14
<b>Subtotal</b>											96	383	984	119	65

Paving 4,263 CY

						VOC	CO	NOx	SO2	PM	VOC	CO	NOx	SO2	PM
						g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	lb	lb	lb	lb	lb
<i>Equipment</i>	<i>Number</i>	<i>Hr/day</i>	<i># days</i>	<i>Hp</i>	<i>LF</i>										
1 Grader	1	4	11	150	0.59	0.68	2.7	8.38	0.93	0.402	6	23	72	8	3
2 Roller	2	4	11	30	0.59	1.8	5	6.9	1	0.8	6	17	24	3	3
1 Paver	1	8	11	107	0.59	0.68	2.7	8.38	0.93	0.402	8	33	103	11	5
Delivery truck	1	1	18	180	0.21	0.68	2.7	8.38	0.89	0.402	1	4	13	1	1
<b>Subtotal</b>											21	77	211	24	12

28 Volume of hot mix asphalt 115,101 ft<sup>3</sup>  
 42 Average density of HMA 145 lb/ft<sup>3</sup>  
 CARB EF for HMA 0.04 lb/ton  
 VOC emissions from HMA paving 334 lb

### Fugitive Dust Emissions:

PM <sub>10</sub>	days of	PM <sub>10</sub>	PM <sub>2.5</sub> /PM <sub>10</sub>	PM <sub>2.5</sub>
tons/acre/mo	acres	Total	Ratio	Total
0.42	0.8	145	0.1	0.2

### POV Emissions from Construction Workers

Assume 6 miles per day per vehicle (one vehicle per worker)

On-base POV emissions

			VOC	CO	NOx	SOx	PM	VOC	CO	NOx	SOx	PM	
# vehicles	# days	mi/day	g/mi	g/mi	g/mi	g/mi	lb/mi	lb	lb	lb	lb	lb	
2009	42	180	6	0.8415	15.51	0.69	0.0068	0.024900	84	1551	69	1	2
2010	42	160	6	0.7615	14.875	0.63	0.0068	0.024900	68	1322	56	1	2

### 2009 Emission Totals:

VOC	CO	NOx	SO2	PM <sub>10</sub>	PM <sub>2.5</sub>
T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
0.2	0.8	1.0	0.1	0.9	0.1

### 2010 Emission Totals:

VOC	CO	NOx	SO2	PM <sub>10</sub>	PM <sub>2.5</sub>
T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
0.2	0.7	0.9	0.1	0.8	0.1