Environmental Assessment
of the
Construction of the Joint Use Small Arms Range for the 934th Airlift Wing Located at Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota

Headquarters Air Force Reserve Command

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14. ABSTRACT

This EA contains specific information regarding the purpose of and need for the Proposed Action, a detailed description of the Proposed Action, the alternatives to the Proposed Action, and the No Action Alternative. The Proposed Action includes the demolition of the existing small arms range and the construction of a new, partially contained range. The shooting area would be designed and constructed as a single enclosure, divided into two separate sections, totaling 28 expanded firing positions. This EA has been prepared to evaluate the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative. Impact categories that are considered in the impact analysis include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The EA is being made available to the public prior to completion. This EA was made available for public review and comment beginning August 31, 2006 and ending September 30, 2006. Comments received from this review were addressed in the EA. Letters received from the review period are contained in Appendix B.

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ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
133 AW	133rd Airlift Wing
934 AW	934th Airlift Wing
ACM	Asbestos-containing material
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AFRC	Air Force Reserve Command
AGE	aerospace ground equipment
APE	Area of Potential Effect
AQCR	Air Quality Control Region
ARS	Air Reserve Station
AST	aboveground storage tank
BLS	Bureau of Labor Statistics
BMP	best management practice
CAA	Clean Air Act
C & D	construction and demolition
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES	Civil Engineering Squadron
CEV	Civil Engineer Environmental Flight
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DNL	Day-Night Average A-weighted Sound Level
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ETL	Engineering Technical Letter
FEMA	Federal Emergency Management Agency
FICON	Federal Interagency Committee on Noise
FIRM	Flood Insurance Rate Map
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
ft^2	square foot
GOV	government-owned vehicle
HAZMART	hazardous materials pharmacy
HAZMAT	hazardous materials
HUD	U.S. Department of Housing and Urban Development
HWMP	Hazardous Waste Management Plan
I	Interstate
IAP	international airport
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JIT	just-in-time
kg	kilogram
LBP	lead-based paint
LFA	lead-free ammunition
mg/Kg	milligrams per Kilogram
mg/liter	milligrams per liter
mg/m^3	milligrams per cubic meter
MNRRA	Mississippi National River and Recreation Area

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MPCA	Minnesota Pollution Control Agency
MSA	Metropolitan Statistical Area
MSG	Mission Support Group
MSL	mean sea level
MSPAFR	Minneapolis-St. Paul U.S. Air Force Reserve
MSPARS	Minneapolis-St. Paul Air Reserve Station
MSPI	Minneapolis–St. Paul Intrastate
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NZ	Noise Zone
O_3	ozone
ORM	Operational Risk Management
OSHA	Occupational Safety and Health Administration
Pb	lead
PEL	permissible exposure limit
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
POL	petroleum, oil and lubricants
POV	privately owned vehicles
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SARL	small arms range landfill
SARNAM	Small Arms Range Noise Assessment Model
SDZ	Surface Danger Zone
SE	Safety Office
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
TCP	traditional cultural property
tpy	tons per year
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compounds
VSQG	Very Small Quantity Generator

FINDING OF NO SIGNIFICANT IMPACT/FINDING OF NO PRACTICABLE ALTERNATIVE (FONSI/FONPA)

ENVIRONMENTAL ASSESSMENT OF THE CONSTRUCTION OF THE JOINT USE SMALL ARMS RANGE FOR THE 934TH AIRLIFT WING AT THE MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT AIR RESERVE STATION, MINNESOTA

INTRODUCTION

The Minneapolis-St. Paul International Airport (IAP) Air Reserve Station (ARS) is in Hennepin County, on the north side of Minneapolis-St. Paul IAP. The 934th Airlift Wing (934 AW) is the host unit at the Minneapolis-St. Paul IAP ARS and is the only Air Force Reserve unit located within the State of Minnesota. In addition to the 934 AW, Minneapolis-St. Paul IAP accommodates the Minnesota Air National Guard 133rd Airlift Wing (133 AW), U.S. Naval Air Reserve Center, and U.S. Marine Corps Reserve. The mission of the 934 AW is to fly C-130H cargo aircraft and to conduct aeromedical evacuation of patients. The 934 AW supports the U.S. Air Force (USAF) mission on a daily basis, providing airlift capability both in the United States and around the world.

The existing small arms range at Minneapolis-St. Paul IAP ARS was the subject of a safety evaluation in 2004. USAF Headquarters and Air Force Reserve Command (AFRC) personnel determined that the small arms range did not meet the criteria set forth in Engineering Technical Letter (ETL) 02-11, which provides criteria for the design and construction of USAF small arms firing ranges. It was recommended that Minneapolis-St. Paul IAP ARS cease use of the range until all of the criteria in the ETL 02-11 were addressed. Before the 2004 ORM Study, the groups that used the small arms range included the 934 AW, 133 AW, Federal Air Marshals, Secret Service, and many local police departments.

After the USAF and AFRC determination, an *Operational Risk Management (ORM) Study* was completed. Based upon the ORM analysis and specific recommendations, the 934th Security Forces Squadron Combat Arms Section and the 133rd Security Forces Squadron Combat Arms Section were allowed to resume limited use of the small arms range for weapon qualifications for certain personnel and after specified procedural modifications were implemented. Use by other personnel is now suspended.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The USAF proposes to demolish the current small arms range and construct a new, partially enclosed small arms range. The need for the Proposed Action is to address the safety issues identified in the 2004 ORM Study and provide range access to prior users.

Since the change in utilization in 2004, the use of the small arms range has been significantly reduced due to the critical safety procedures necessitated by the identified deficiencies. The number of rounds fired annually has decreased from 500,000 to around 110,000. Without the ability to fire their duty weapons, many military organizations and homeland defense agencies are unable to accomplish required proficiency training.

In addition, the existing small arms range does not meet criteria for 934 AW personnel to practice with automatic weapons. Currently, 934 AW personnel must travel to another firing range for automatic weapons practice.

DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, the existing small arms range will be demolished and a new, partially contained range will be constructed. The small arms range has been operational in its present location for reason of safety. The use of ammunitions requires safety distances that ensure no harm to human life. The existing range has always been located within the 100-year floodplain. The new range will be in the general footprint of the existing range. The design of the proposed range will meet the requirements addressed in ETL 05-5 (Change 1): *Small Arms Range Design and Construction.*

Under the Proposed Action, the existing canopy and bullet trap will be removed and replaced. A 12,002 square-foot concrete pad will be added between the firing line and target line. The new facility will be built with cinder block

walls, metal doors, and a concrete sidewalk. The proposed small arms range will capture direct-fired bullets and contain all ricochets thereby eliminating any potential for ricochets from leaving the enclosure. The range will include overhead baffles, infrared heat over the firing lanes, lights, ventilation, and a sound system. The perimeter fence will be upgraded, as needed, and minor improvements to existing roads proximate to the range will occur. The proposed small arms range will have a restroom, new water supply, and septic system. Storm water management at the proposed site also will be addressed through the addition of new stormwater retention ponds.

Soil contaminated with lead above the applicable toxicity characterization thresholds, if moved during construction, will be either disposed off-site as hazardous waste, or treated on-site within the area of contamination under a Minnesota Pollution Control Agency-approved clean-up plan, followed by disposal off-site in an appropriate-regulated landfill.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

Based on the analyses accomplished as a part of the preparation of the Environmental Assessment (EA), it was determined that no significant adverse effects on land use, biological resources, cultural resources, or environmental justice are expected at Minneapolis-St. Paul IAP ARS as a result of the demolition and construction of the small arms range. Short-term minor beneficial effects on socioeconomics are expected as a result of construction activities. Long-term beneficial effects on storm water and hazardous waste management are expected as a result of the retention ponds.

Minor adverse effects on the noise environment are expected as a result of the Proposed Action. Short-term minor adverse effects on safety, water resources, infrastructure, and solid waste resources are expected as a result of construction activities. Adverse effects associated with construction activities will be localized to the immediate area of construction and will subside following the end of construction in the project area. The generation of construction waste will be an unavoidable adverse impact but will be insignificant in scale. There will be minor long-term adverse effects on geologic resources, water resources, and biological resources. The impact on the floodplain volume will be offset by the creation of storm water retention ponds.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

This EA was made available for public review and comment beginning August 31, 2006 and ending September 30, 2006. Comments received from this review were addressed in the EA.

FINDING OF NO SIGNIFICANT IMPACT/FINDING OF NO PRACTICABLE ALTERNATIVE

After a review of the EA prepared in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, the USAF's Environmental Impact Analysis Process (32 Code of Federal Regulations 989, as amended), and receipt of public comments on the document, I have determined that the Proposed Action will not have significant adverse effects on the quality of the human or natural environment and, therefore, an Environmental Impact Statement does not need to be prepared. Pursuant to Executive Order 11988 Floodplain Management and Executive Order 11990 Protection of Wetlands, and the authority delegated to me in Secretary of the Air Force Order 791.1, and taking the above information into account, I have determined that there is no practicable alternative to the Proposed Action and the alternatives include all practicable measures to minimize harm to wetland and floodplain environments. This decision has been made after taking into account all submitted information and considering a full range of practicable alternatives that would meet project requirements and that are within the legal authority of the USAF.

STEVEN W. ZANDER, Colonel, USAF
The Civil Engineer

29 Dec 06
Date

ENVIRONMENTAL ASSESSMENT OF THE

CONSTRUCTION OF THE JOINT USE SMALL ARMS RANGE FOR THE 934TH AIRLIFT WING AT MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT AIR RESERVE STATION, MINNESOTA

HEADQUARTERS AIR FORCE RESERVE COMMAND
ENVIRONMENTAL DIVISION
255 RICHARD RAY BOULEVARD
ROBINS AIR FORCE BASE, GEORGIA 31098-1637

OCTOBER 2006

COVER SHEET

ENVIRONMENTAL ASSESSMENT OF THE CONSTRUCTION OF THE JOINT USE SMALL ARMS RANGE FOR THE 934TH AIRLIFT WING AT THE MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT AIR RESERVE STATION, MINNESOTA

Responsible Agencies: U.S. Air Force (USAF), Headquarters Air Force Reserve Command (AFRC), and 934th Airlift Wing (934 AW), at Minneapolis-St. Paul International Airport (IAP) Air Reserve Station (ARS), Minnesota.

Affected Location: Minneapolis-St. Paul IAP ARS, Minnesota.

Proposed Action: The demolition of the existing small arms range and the construction of a new, partially contained Joint Use Small Arms Range.

Report Designation: Environmental Assessment (EA).

Abstract: This EA contains specific information regarding the purpose of and need for the Proposed Action, a detailed description of the Proposed Action, the alternatives to the Proposed Action, and the No Action Alternative. The Proposed Action includes the demolition of the existing small arms range and the construction of a new, partially contained range. The shooting area would be designed and constructed as a single enclosure, divided into two separate sections, totaling 28 expanded firing positions.

This EA has been prepared to evaluate the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative. Impact categories that are considered in the impact analysis include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The EA is being made available to the public prior to completion.

This EA was made available for public review and comment beginning August 31, 2006 and ending September 30, 2006. Comments received from this review were addressed in the EA. Letters received from the review period are contained in Appendix B.

ENVIRONMENTAL ASSESSMENT OF THE CONSTRUCTION OF THE JOINT USE SMALL ARMS RANGE FOR THE 934TH AIRLIFT WING AT THE MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT AIR RESERVE STATION, MINNESOTA

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1. Purpose of and Need for the Proposed Action

1.1 Background

The Minneapolis-St. Paul International Airport (IAP) Air Reserve Station (ARS) is in Hennepin County, on the north side of the Minneapolis-St. Paul IAP, about 7 to 8 miles southeast of downtown Minneapolis and about 7 to 8 miles southwest of downtown St. Paul. The Minneapolis-St. Paul IAP ARS property is divided into four separate parcels totaling approximately 265 acres. Two of the parcels are adjacent to Minneapolis-St. Paul IAP and two parcels are southeast of Minneapolis-St. Paul IAP and State Route (SR) 5. The existing joint use small arms range (hereafter referred to as the "small arms range") is located in the parcel southeast of Minneapolis-St. Paul IAP between SR 5 and the Minnesota River (see **Figure 1-1**). The parcel containing the small arms range is identified by the U.S. Air Force (USAF) as "Area B."

The 934th Airlift Wing (934 AW) is the host unit at the Minneapolis-St. Paul IAP ARS and is the only Air Force Reserve unit within the state of Minnesota. The mission of the 934 AW is to fly C-130H cargo aircraft and to conduct aeromedical evacuation of patients. The 934 AW supports the USAF mission on a daily basis, providing airlift both in the United States and around the world. Upon mobilization orders, the 934 AW would deploy to become part of the active-duty USAF Air Mobility Command. In addition to the 934 AW, Minneapolis-St. Paul IAP accommodates the Minnesota Air National Guard 133rd Airlift Wing (133 AW), U.S. Naval Air Reserve Center, and U.S. Marine Corps Reserve.

The Proposed Action consists of the demolition of the existing small arms range operated by the 934 AW and the construction of a new range with overhead baffles. The proposed range would be constructed in the same footprint as the existing range. The proposed facility would be used jointly by the 934 AW, the Minnesota Air National Guard, Federal Air Marshals, Secret Service, and local police departments.

The existing small arms range at Minneapolis-St. Paul IAP ARS was the subject of a safety evaluation in 2004. USAF Headquarters and Air Force Reserve Command (AFRC) personnel determined that the small arms range did not meet the criteria set forth in Engineering Technical Letter (ETL) 02-11, which provides criteria for the design and construction of USAF small arms firing ranges. It was recommended that Minneapolis-St. Paul IAP ARS cease use of the small arms range until all of the criteria in the ETL 02-11 were addressed.

After the USAF and AFRC determination, an *Operational Risk Management (ORM) Study* was completed. Based upon the ORM analysis and mission impact, on 11 September 2004, the 934th Security Forces Squadron Combat Arms Section and the 133rd Security Forces Squadron Combat Arms Section were allowed to resume use of the small arms range for weapon qualifications for certain personnel after specified procedural modifications were implemented. According to ETL 02-11 for existing facilities:

Ranges and other facilities designed in accordance with previously published criteria may continue to operate if range safety can be verified under the following conditions:

- *Range safety must be verified using ORM analysis on existing ranges that do not meet new criteria. At wing level, the safety office (SE) provides guidance on how to conduct ORM in accordance with Air Force Instruction (AFI) 91- 213, the ORM Program.*
- *Unsafe conditions must be corrected with appropriate modifications, repairs, or replacements (e.g., additional baffles, increased backstop height, deflector plates).*

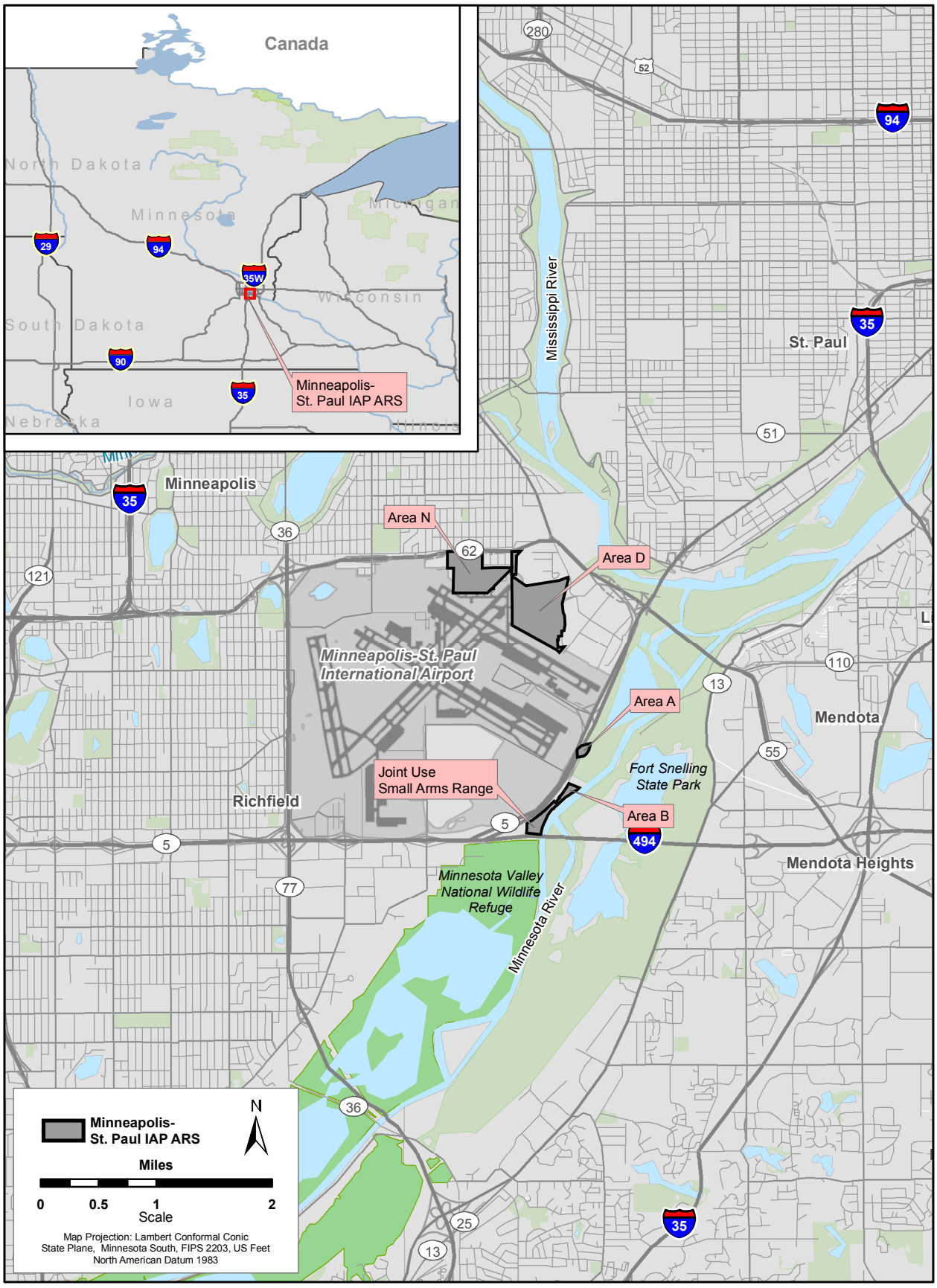

Figure 1-1. Vicinity Map for Minneapolis-St Paul IAP ARS

This Environmental Assessment (EA) addresses potential environmental consequences associated with the Proposed Action and the No Action Alternative. Details on the Proposed Action are presented in **Section 2**.

If the analyses presented in this EA were to indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, a Finding of No Significant Impact (FONSI) or Finding of No Practicable Alternative (FONPA) (if applicable) would be prepared. A FONSI briefly presents the reasons why a Proposed Action would not have a significant impact on the human environment and explains why the preparation of an Environmental Impact Statement (EIS) would not be required. A FONSI/FONPA would be signed if the USAF has found no practicable alternatives to construction within wetlands or floodplains. If significant environmental issues were to be identified that cannot be mitigated to insignificant levels, an EIS would be prepared or the Proposed Action would be abandoned and no action would be taken.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to construct a new, partially contained small arms range in the general footprint of the existing small arms range. The need for the Proposed Action is to ensure that military personnel can accomplish all required proficiency training and to address the safety issues identified in the 2004 ORM Study.

The small arms range is currently operating under limited use as a result of facility safety issues identified in the 2004 ORM Study. The number of personnel that are allowed to use the small arms range and the type of weapons training activities have been restricted since the 2004 ORM Study was completed. In order for military personnel to accomplish proficiency training and accomplish their mission, the existing small arms range needs to be modified to meet safety standards so that the resumption of full weapons training can take place.

Since 2004, the use of the small arms range has been significantly reduced due to critical safety deficiencies. The number of rounds fired annually has decreased from 500,000 to 111,000 in Fiscal Year 2005. Without the ability to fire their duty weapons, many military organizations and homeland defense agencies are incapable of maintaining minimum proficiency. Before the 2004 ORM Study, the groups that used the small arms range included the 934 AW, 133 AW, Federal Air Marshals, Secret Service, and many local police departments. Since the 2004 ORM analysis, only personnel from the 934 AW and 133 AW have been allowed to use the range and the following conditions were implemented:

- Combat Arms Instructors make students aware of the range deficiencies prior to firing
- Combat Arms Instructors do not allow students to fire across lanes
- The 934 AW conducts more frequent safety spot inspections of the range.

In addition, the existing small arms range does not meet criteria for 934 AW personnel to practice with automatic weapons. Currently, 934 AW personnel must travel to another firing range.

1.3 Summary of Key Environmental Compliance Requirements

1.3.1 National Environmental Policy Act

The National Environmental Policy Act (commonly referred to as "NEPA") (42 United States Code [U.S.C.] Sections 4321–4347) is a Federal statute requiring the identification and analysis of potential

environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed, structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a FONSI or whether the preparation of an EIS is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is its *Environmental Impact Analysis Process (EIAP)*, generally described in AFI 32-7061 and detailed in 32 CFR Part 989, as amended.

1.3.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with a Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

This EA examines potential effects of the Proposed Action and No Action Alternative on 11 resource categories: noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials (HAZMAT) and wastes. These resource categories were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment where the review is mandated by Executive Order (EO), regulation, or policy.

Appendix A contains examples of relevant laws, regulations, and other requirements that are often considered part of the analysis. Only those laws, regulations, and other requirements relevant to resource categories analyzed in this EA are included in **Appendix A**. In addition, various permits could be required for construction activities. The EA is not a substitute for those permit requirements. AF Form 103, *Base Civil Engineering Work Clearance Request*, is required for USAF projects under AFI 32-1001, *Operations Management*.

1.4 Interagency Coordination and Public Involvement

The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs,* require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (IICEP), requires the USAF, and thus AFRC, to implement the IICEP process, which is used for the purpose of agency coordination and implements scoping requirements (i.e., to determine the scope of issues to be addressed in detail in the EA). Through the IICEP process, the USAF notifies relevant Federal, state, and local agencies of the Proposed Action and alternatives and provides them sufficient time to make known their environmental concerns specific to the action. IICEP materials are included in **Appendix B**.

NEPA requirements also help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if Federal proponents of an action provide information to state and local governments and the public and involve them in the planning process. CEQ guidance in 40 CFR 1501.7 specifically states, "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to proposed actions. This process shall be termed scoping." The public involvement process augments the USAF opportunity to cooperate with and consider state and local views in implementing a Federal proposal. For the action addressed in this EA, a Notice of Availability for the EA is to be published in the Star Tribune and the document will be placed in at the Minneapolis Public Library, Science and Technology/Environmental Conservation, 300 Nicollet Mall, Minneapolis, Minnesota 55401. If the analysis indicates that the Proposed Action would not result in a significant environmental impact, a FONSI would be made available.

1.5 Organization of the EA

This EA is organized into six sections. **Section 1** contains background information on Minneapolis-St. Paul IAP ARS, a statement of the purpose of and need for the Proposed Action, a summary of applicable regulatory requirements, a discussion of agency coordination and public involvement, and an introduction to the organization of the EA. **Section 2** provides a detailed description of the Proposed Action and a discussion of the alternatives considered, including the No Action Alternative; and a description of the decision to be made and identification of the preferred alternative. **Section 3** contains a characterization of the affected environment, or baseline environmental conditions, and addresses potential environmental consequences associated with the Proposed Action and the No Action Alternative. **Section 4** provides an analysis of the potential cumulative impacts. **Section 5** presents the preparers of the document. **Section 6** lists the reference documents used in the preparation of the EA. Various appendices support this EA and provide additional data and information.

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2. Description of Proposed Action and Alternatives

This section provides detailed information on the Proposed Action that has been considered in preparing this EA. **Figure 2-1** shows the general layout of the existing small arms range.

2.1 Detailed Description of the Proposed Action

Under the Proposed Action, the existing range would be demolished and a new, partially contained range would be constructed. On 8 November 2005, ETL 02-11 was updated with ETL 05-5 (Change 1): *Small Arms Range Design and Construction*. The design of the proposed range would meet the requirements addressed in ETL 05-5. The proposed range would have 28 firing positions split evenly between two enclosures which would allow for two small classes. Each enclosure would have 14 lanes. The number of firing lanes would be the same as in the existing facility; however, the width between the firing lanes would increase from 4 feet to 5 feet in the proposed facility. As a result, the size of the small arms range would expand. Under the Proposed Action, the 934 AW would continue to operate the small arms range at its current location on Minneapolis-St. Paul IAP ARS property.

2.1.1 Small Arms Range Evaluation Criteria

Selection criteria used for evaluating the potential alternatives includes the following concerns:

1. Military organizations and homeland defense agencies need to be capable of maintaining maximum proficiency to accomplish their missions.

2. The small arms range must be compliant with the safety issues identified in the 2004 ORM Study.

3. The small arms range must be within 15 miles of the Minneapolis-St. Paul IAP ARS.

2.1.2 Proposed Range and Site Modifications

Under the Proposed Action, the existing canopy and bullet trap would be removed and replaced. A 12,002 square foot (ft^2) concrete pad would be added between the firing line and target line. The new facility would be built with cinder block walls, metal doors, and a concrete sidewalk. The proposed small arms range would capture direct-fired bullets and contain all ricochets; thereby eliminating any ricochets from leaving the enclosure. The small arms range would include overhead baffles, infrared heat over the firing lanes, lights, ventilation, and a sound system. The fenceline would be modified and replaced, and approximately 200 feet of the existing road between the range and the Minnesota River would be reconstructed. **Figure 2-2** illustrates the proposed range and site modifications.

The proposed small arms range would have a restroom, new water supply, and septic system. Currently, there are no water supply facilities at the site; all potable water is transported on-site. The proposed water facilities would require approval from the Minnesota Department of Natural Resources and the Minneapolis Water Department. It is assumed that the new waterline would tie into an existing public water treatment system. The septic system would be installed to provide treatment of waste from the new restroom. The system would be designed and constructed by a "Licensed Individual Sewage Treatment System Designer and Installer," and inspected in accordance with Minnesota Pollution Control Agency and Hennepin County requirements. A permit from the County Health Department would be required.

Since the existing small arms range has been in use since 1951, and possibly earlier, soil sampling was performed in April 2006 to determine the level of soil contamination. Several of these samples showed

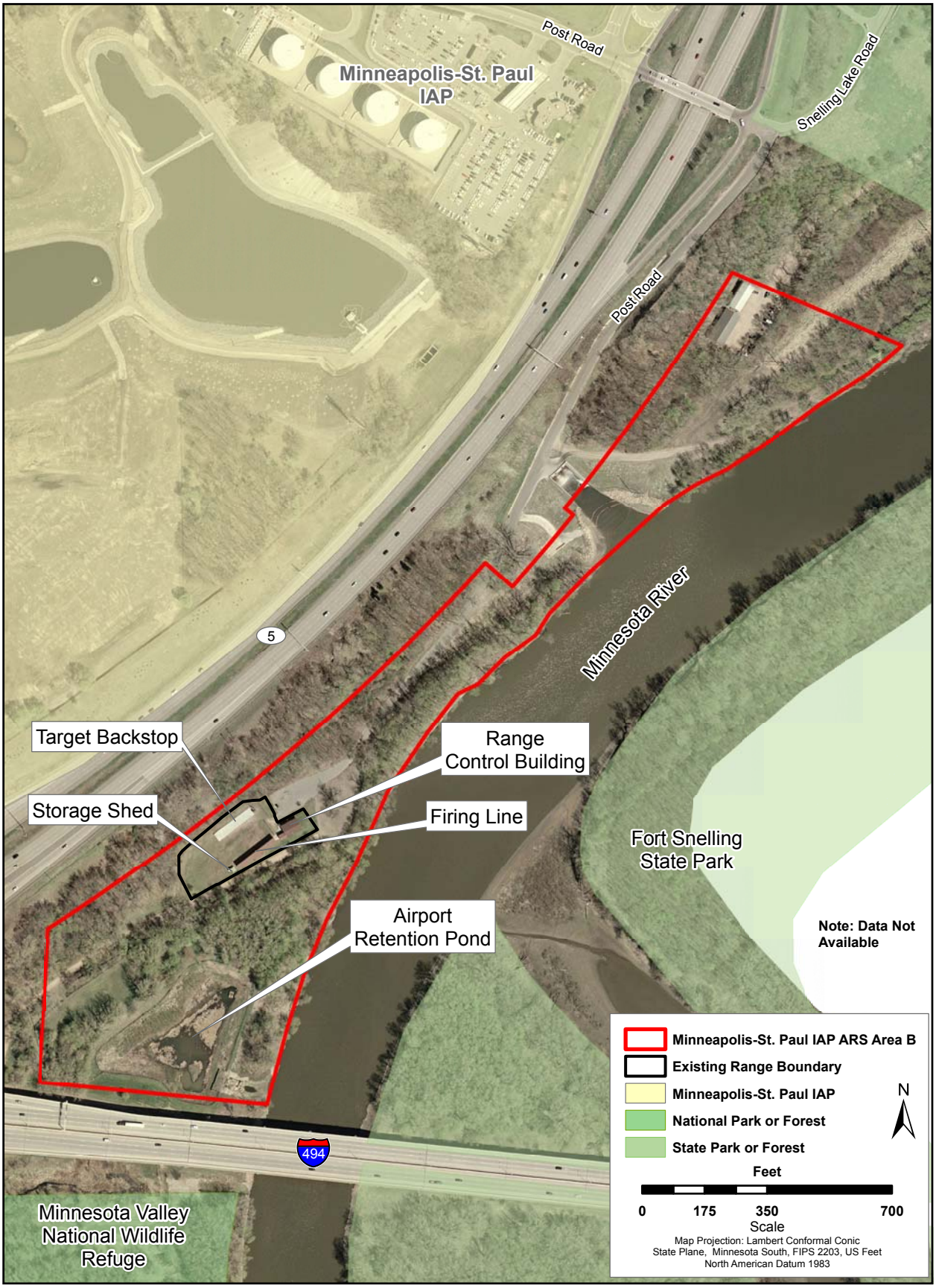
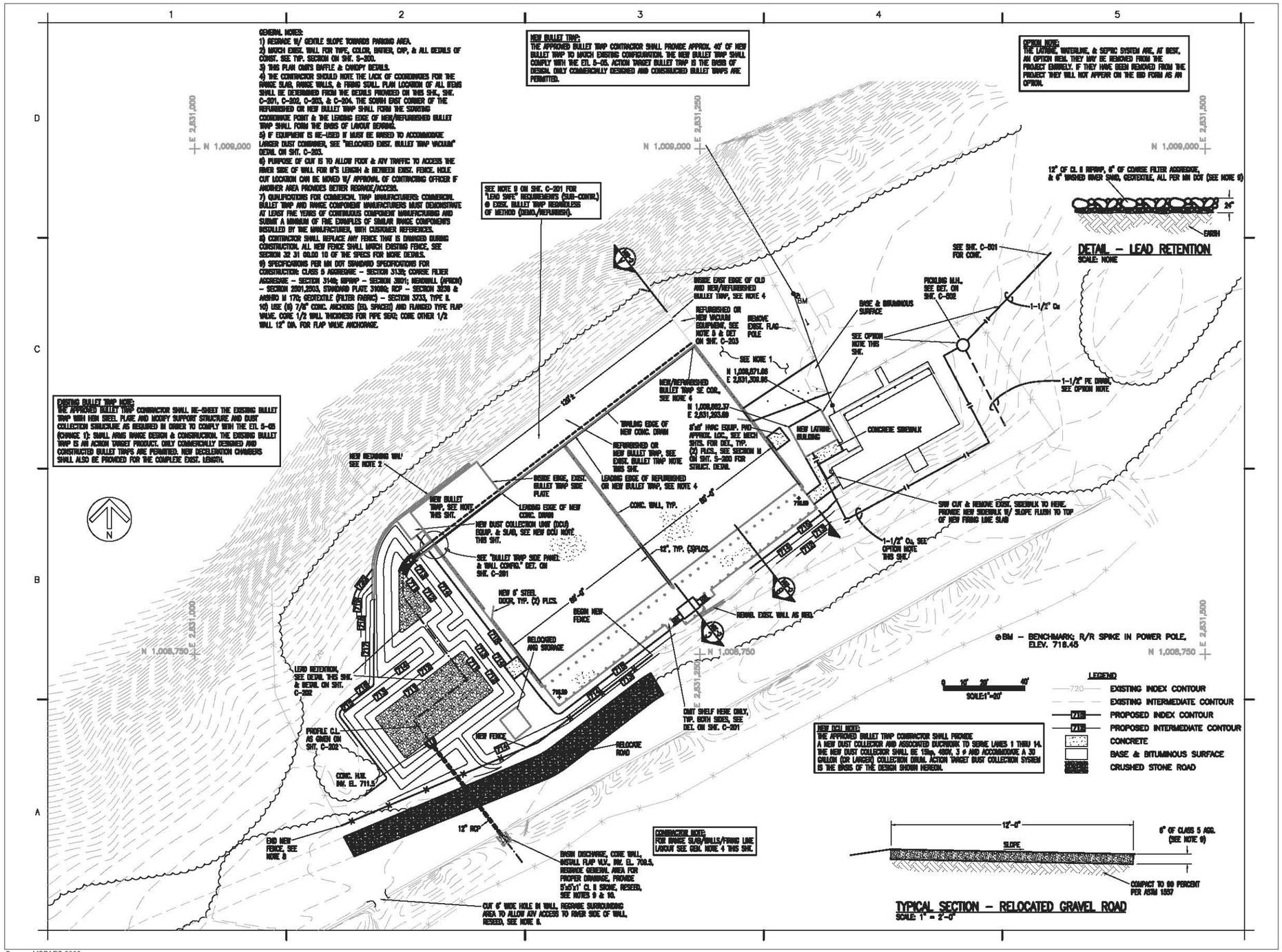


Figure 2-1. Joint Use Small Arms Range



Source: MSPARS 2006

Figure 2-2. Proposed Joint Use Small Arms Range and Site Modifications

elevated levels of lead. Regulatory guidance provided to the 934 AW by the Minnesota Pollution Control Agency specifies that soil contaminated with lead above the toxicity characterization threshold of 5.0 milligrams per liter (mg/liter), if moved during construction, would require either disposal off-site as hazardous waste, or treatment on-site within the area of contamination under an agency-approved clean-up plan followed by disposal off-site in a specified landfill.

Storm water management at the proposed site would be addressed through retention ponds. Runoff from the firing range area would drain to a concrete trench drain and then empty into the first of two small retention ponds. The retention areas would be designed to slow runoff and allow the settlement of any lead particles. Water from retention ponds would discharge onto rip-rap and graded ground surfaces and would not discharge into the Minnesota River. A crushed stone berm would separate the two retention ponds and a drainage outlet would be installed at the second basin to allow for discharge. This outlet would include a flap valve to prevent backflow from the river during highwater events.

2.1.3 Firing Range Weapons and Activities

The 934 AW and 133 AW currently use a variety of small arms at the existing small arms range. However, personnel cannot currently fire automatic weapons at the existing facility because the range does not meet the required USAF ETL design criteria. Presently, automatic weapon training occurs at an off-site range. Under the Proposed Action, the small arms range would be built to meet the necessary criteria for automatic weapons use. Using Fiscal Year 2005 data, the number of annual rounds fired from non-automatic weapons totals approximately 111,000. The total number of rounds fired following construction would increase by approximately 25 percent to 139,000 annually.

2.2 Alternatives to Proposed Action

2.2.1 Introduction

Under NEPA, reasonable alternatives to a Proposed Action must be considered in an EA. Considering alternatives helps to avoid unnecessary impacts and allows analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be "ripe" for decisionmaking (i.e., any necessary preceding events have taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and the need for the action. The following discussion identifies alternatives considered by the USAF and identifies whether they are reasonable and, hence, subject to detailed evaluation in this EA.

2.2.2 Close 934 AW Small Arms Range Alternative

This alternative would close the small arms range permanently. Closing the range would require 934 AW and 133 AW personnel to travel to off-site ranges. The closest military range is about 230 miles round trip. The Burnsville Pistol Range, which is the nearest civilian pistol range, is 32 miles round trip. This range only has five firing lanes and is not available for USAF use from 1 October to 1 March. USAF personnel would not be able to qualify with their M16 weapons at civilian-owned ranges, such as the Burnsville Pistol Range.

Traveling to an off-site small arms range presents additional safety risk factors. Transporting weapons and ammunition would expose military personnel and civilians to the possibility of an explosive-related incident. AFI 91-201, *Explosive Safety Standards,* states "Expose the minimum number of personnel to the minimum amounts of explosives for the minimum time." Some military personnel are required to fire during night-time hours on a semi-annual basis. Adding extended travel times to a normal training day

would increase stress and fatigue factors for both the students and instructors. This alternative does not meet the third criterion established in **Section 2.1.1**. Considering the travel requirements and the safety risks, this alternative is not considered feasible and has not been evaluated in detail in **Section 3** of this EA.

2.2.3 Construct the 934 AW Small Arms Range at a Different Area on Minneapolis-St. Paul IAP ARS Property

Under this alternative the small arms range would be built at a different area on Minneapolis-St. Paul IAP ARS property. As previously mentioned, property owned by the Minneapolis-St. Paul IAP ARS is divided into four separate parcels. Two of the parcels (Area N and Area D) are adjacent to Minneapolis-St. Paul IAP, and one parcel (Area A) is southeast of Minneapolis-St. Paul IAP (see **Figure 1-1**). The fourth parcel is Area B where the existing small arms range is located.

Area N and Area D are the site of 934 AW's headquarters, aircraft maintenance facilities, aviation-related support facilities and community facilities. These areas are also adjacent to Runway 12L/30R as well as the control tower and terminal at Minneapolis-St. Paul IAP.

Area A is situated on a bluff overlooking the Minnesota River and is the site of the 934 AW Officer's Club. Area A is also along the flightline of Runway 12R/30L; the Clear Zone at the end of Runway 12R extends onto an undeveloped part of Area A. A Clear Zone is a safety area designated by the USAF; buildings are not recommended in Clear Zones. Since the developed portion of this parcel consists of the Officer's Club, and a portion of the undeveloped property in the Clear Zone, there is no future development planned on this property.

Constructing a small arms range at Area N, Area D, or Area A would introduce significant, and likely unresolvable, range safety and land use conflicts not associated with the current location. This alternative does not meet the second criterion established in **Section 2.1.1**, and is therefore not considered feasible and has not been evaluated in detail in this EA.

2.2.4 Modify the Current 934 AW Small Arms Range

Under this alternative, there would be minor modifications to the existing small arms range. A left side wall would be built and both walls would be constructed so that they extend down the range to the firing line. This alternative would likely reduce the chances of a bullet ricochet leaving the range, which would improve the overall safety of the small arms range.

Numerous modifications associated with the Proposed Action would not be included in this alternative including overhead baffles, a new bullet trap system, and a paved floor. Unless all of the walls of the small arms range are reconstructed, it would be difficult to add overhead baffles. Overhead baffles were one of the key components identified in the 2004 ORM Study. According to ETL 05-5, a fully contained range design must preclude escape of both direct-fired projectiles and ricochets. "Blue sky" should not be visible from any firing position or as one travels downrange towards the target. Overhead baffles prevent "blue sky" visibility.

The bullet trap at the existing small arms range has exposed steel plate edges that are not filleted properly. Consequently bullets can ricochet and leave the enclosure. In addition, the existing small arms range floor consists of dirt and is not graded properly which can lead to standing water. Currently, Combat Arms Instructors manually remove standing water prior to firing to eliminate the possibility of the water causing a ricochet problem.

Minor modifications to the existing small arms range would not address all of the safety needs cited in the 2004 ORM Study and therefore do not meet the second criterion established in **Section 2.1.1**. Existing safety deficiencies would remain and the range would continue to operate at a reduced capacity. Considering these factors, this alternative is not considered feasible and has not been evaluated in this EA.

2.3 No Action Alternative

CEQ regulations require analysis of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated.

Under the No Action Alternative, the Proposed Action would not be implemented. Minneapolis-St. Paul IAP ARS would continue to operate with the current small arms range. Under the No Action Alternative, only 934 AW and 133 AW personnel would be able to use the facility, however, the range would continue to operate at a reduced capacity. The current limitations would remain and these include provisions that Combat Arms Instructors must make students aware of the range deficiencies prior to firing, instructors may not allow students to fire across lanes, and the 934 AW conducts more frequent safety spot inspections of the range. Also, the existing small arms range does not meet USAF criteria for 934 AW personnel to practice with automatic weapons. The No Action Alternative is evaluated in detail in this EA.

2.4 Decision to be Made and Identification of Preferred Alternative

Upon completion of the EA, the USAF will determine whether the Proposed Action would result in significant impacts. If such impacts are predicted, 934 AW would provide mitigation to reduce impacts below the level of significance, undertake an EIS, or abandon the Proposed Action. The EA will also be used as a guide to implementing the Proposed Action in a manner consistent with USAF standards for environmental stewardship. The preferred alternative is the Proposed Action, as described in **Section 2.1**.

3. Affected Environment and Environmental Consequences

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, the description of the affected environment focuses on those resource areas and conditions potentially subject to impacts. These resource areas and conditions include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The information on existing conditions given for a resource area is considered the baseline against which potential effects of implementing either the Proposed Action or the No Action Alternative can be evaluated.

The specific criteria for evaluating potential environmental effects associated with the Proposed Action or the No Action Alternative are also presented under each resource area. The significance of an action is measured in terms of its context and intensity. The following elaborates on the nature of characteristics that might relate to various environmental effects. Individual resource area subsections provide more subject-specific evaluation criteria.

Short-term or long-term. In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.

Direct or indirect. A direct effect is caused by an action and occurs around the same time at or near the location of the action. An indirect effect is caused by an action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.

Negligible, Minor, moderate, or significant. These relative terms are used to characterize the magnitude or intensity of an impact. Negligible effects are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight, but detectable. A moderate effect is readily apparent. A major effect is one that is severely adverse or exceptionally beneficial. Significant effects are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation in order to fulfill the policies set forth in NEPA.

Adverse or beneficial. An adverse effect is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment.

3.1 Noise

3.1.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof. Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. All sound levels analyzed in this EA are A-weighted.

Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent

or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (i.e., schools, churches, or hospitals) or broad areas (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Regulations and Metrics. Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The following paragraphs describe the guidelines and regulations that are relevant to the project.

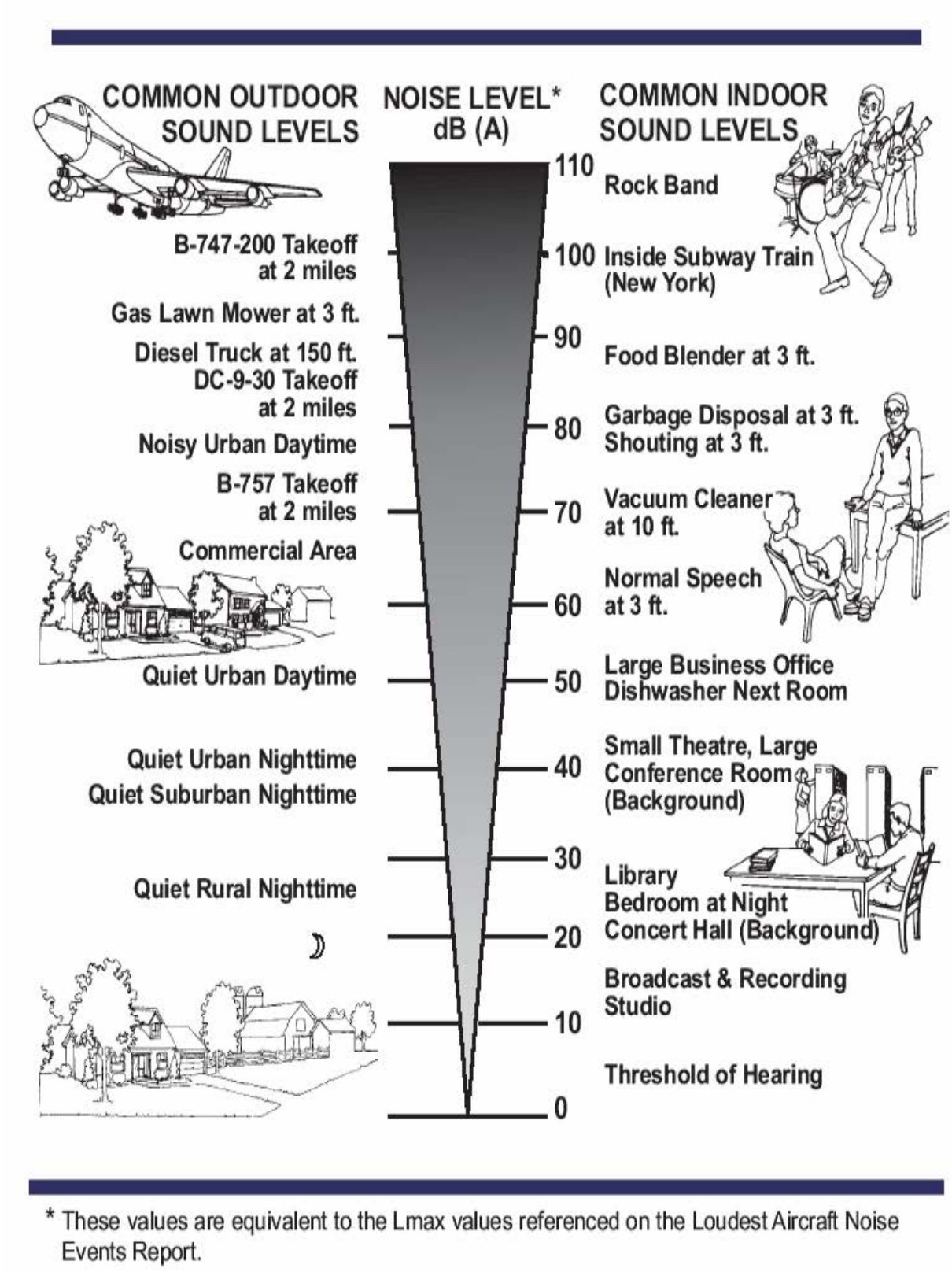
According to USAF and U.S. Department of Housing and Urban Development (HUD) criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds 75 Day-Night Average A-weighted Sound Level (DNL), "normally unacceptable" in regions exposed to noise between the 65 and 75 DNL, and "normally acceptable" in areas exposed to noise of 65 DNL or under. The DNL noise metric incorporates a "penalty" for evening and nighttime noise events to account for increased annoyance during these time periods. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure level values for a given 24-hour period.

The Federal Interagency Committee on Noise (FICON) developed land-use compatibility guidelines for noise in terms of DNL (FICON 1992). For outdoor activities, U.S. Environmental Protection Agency (USEPA) recommends 55 DNL as the sound level below which there is no reason to suspect that the general population will be at risk from any of the effects of noise (USEPA 1974). DNL is the metric recognized by the U.S. government for measuring noise and its impacts on humans.

Noise Zones. DNL metrics are applied to Noise Zones (NZs), which are used to estimate the percentage of a population impacted by small arms noise levels. NZs are estimated from a computer modeling program and are described in the following section.

- NZ III consists of the area around the source of the noise in which the DNL is greater than 75 dB. The noise levels within NZ III are considered so severe that noise-sensitive land uses should not be considered therein. Noise-sensitive land uses include residences, schools, medical facilities, and churches.
- NZ II consists of an area where the DNL is between 65 and 75 dB. Exposure to noise within this area is considered significant and use of land within NZ II should normally be limited to activities such as industrial, manufacturing, transportation, and resource production. However, if the community determines that land in NZ II areas must be used for residential purposes, then noise level reduction features should be incorporated into the design and construction of the buildings.
- NZ I includes all areas around a noise source in which the DNL is equal to or less than 65 dB. This area is usually suitable for all types of land use activities.

Ambient Sound Levels. In general, ambient sound is background sound associated with a given environment. Examples of ambient noise sources include wind, humming fluorescent lights, power transformers, and other equipment noises. When sound sources are too distant or weak to be isolated, they are considered ambient. Noise levels in residential areas vary depending on the housing density and location. The common sound sources identified in **Figure 3-1** can contribute to the overall ambient sound



Source: Landrum & Brown 2002

Figure 3-1. Common Noise Levels

levels or become a noise source depending on how an individual responds to the sound source. As shown, a quiet urban area is about 55 dBA, which increases to 65 dBA for a commercial area, and 80 dBA for a noisy urban area.

Construction Sound Levels. Building construction, modification, and demolition work can cause an increase in sound that is well above the ambient level. A variety of sounds come from graders, pavers, trucks, welders, and other work processes. **Table 3-1** lists noise levels associated with common types of construction equipment that are likely to be used under the Proposed Action. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3-1. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Grading	
Bulldozer	87
Grader	85
Water Truck	88
Paving	
Paver	89
Roller	74
Demolition	
Loader	85
Haul Truck	88
Building Construction	
Generator Saw	81
Industrial Saw	83
Welder	74
Truck	80
Forklift	67
Crane	83

Source: COL 2001

3.1.2 Existing Conditions

The ambient sound environment around the small arms range is characterized primarily by aircraft operations, automobile traffic, and small arms range activities. Commercial aircraft operations at Minneapolis-St. Paul IAP and automobiles traveling down the highway are the primary sound sources contributing to the ambient sound environment in the vicinity of the small arms range.

Minneapolis-St. Paul IAP aircraft operations are the primary contributor to the small arms range ambient noise environment. The 934 AW bases the C-130H cargo aircraft at Minneapolis-St. Paul IAP. There are 162 aircraft based at Minneapolis-St. Paul IAP and approximately 1,481 operations a day. Military

aircraft at Minneapolis-St. Paul IAP account for less than 1 percent of the total number of operations. About 90 percent of the aircraft operations at Minneapolis-St. Paul IAP are from commercial aircraft and air taxis (AirNav 2006). Consequently these aircraft are likely the largest contributor to aircraft noise in the area. The small arms range is inside of the 65 DNL noise contour from aircraft operations at Minneapolis-St. Paul IAP (AFRC 2006) (see **Figure 3-2).** As previously mentioned, the Department of Defense (DOD) and other Federal agencies use the 65 DNL as a land use planning threshold.

Several general aviation airports are also in the area. The St. Paul Downtown Airport (also known as Holman Field) is 8 miles northeast of Minneapolis-St. Paul IAP and the South St. Paul Municipal Airport is 8 miles east. Flying Cloud Airport is 11 miles west of Minneapolis-St. Paul IAP. It is likely that the surrounding airports contribute slightly to the ambient noise level in the environment.

In addition to aircraft noise sources and noise from weapons training, traffic contributes to the noise environment in the vicinity of the small arms range. Major transportation routes include Interstate (I)-494 which borders the facility on the south side and SR 5, which is adjacent to the small arms range to the northwest. I-494 traverses east-west to the south of Minneapolis and Minneapolis-St. Paul IAP, and SR 5 lies in a southwest-northeast direction on the east side of Minneapolis-St. Paul IAP. Access to the small arms range is obtained via Post Road which connects to SR 5.

Small arms noise contours can be generated using the Small Arms Range Noise Assessment Model (SARNAM). The model incorporates the latest available information on weapons noise source models (including directivity and spectrum), sound propagation, and effects of noise mitigation and safety structures (walls, berms, and ricochet barriers). SARNAM uses a more suitable noise metric than has been previously used for small arms in the United States. It includes a variety of weapons in the source library, can handle multiple ranges of various types, and is designed to maximize user productivity. The graphical output shows noise contours and range boundaries and can also display installation features.

The small arms data were modeled in the SARNAM program using DNL metrics. SARNAM calculates the noise from the weapons fired over a chosen period of time. Since the existing small arms range is used at least once a week, noise for the baseline scenario and the Proposed Action were calculated over a 52-day period. The 52-day time period was chosen because it represents the most conservative case, or worst-case scenario, when calculating noise.

The existing contours were calculated from the approximate number of annual rounds fired (111,000) by personnel in the 934 AW and 133 AW in Fiscal Year 2005. Noise contours from existing weapons at the small arms range are shown on **Figure 3-2**. As shown, the 65 DNL contour does not extend beyond the Minneapolis-St. Paul IAP ARS property. As discussed previously, the 65 DNL contour is considered to be the threshold of significance for noise impacts on noise-sensitive areas.

3.1.3 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), minor (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise effects were evaluated qualitatively for the Proposed Action.

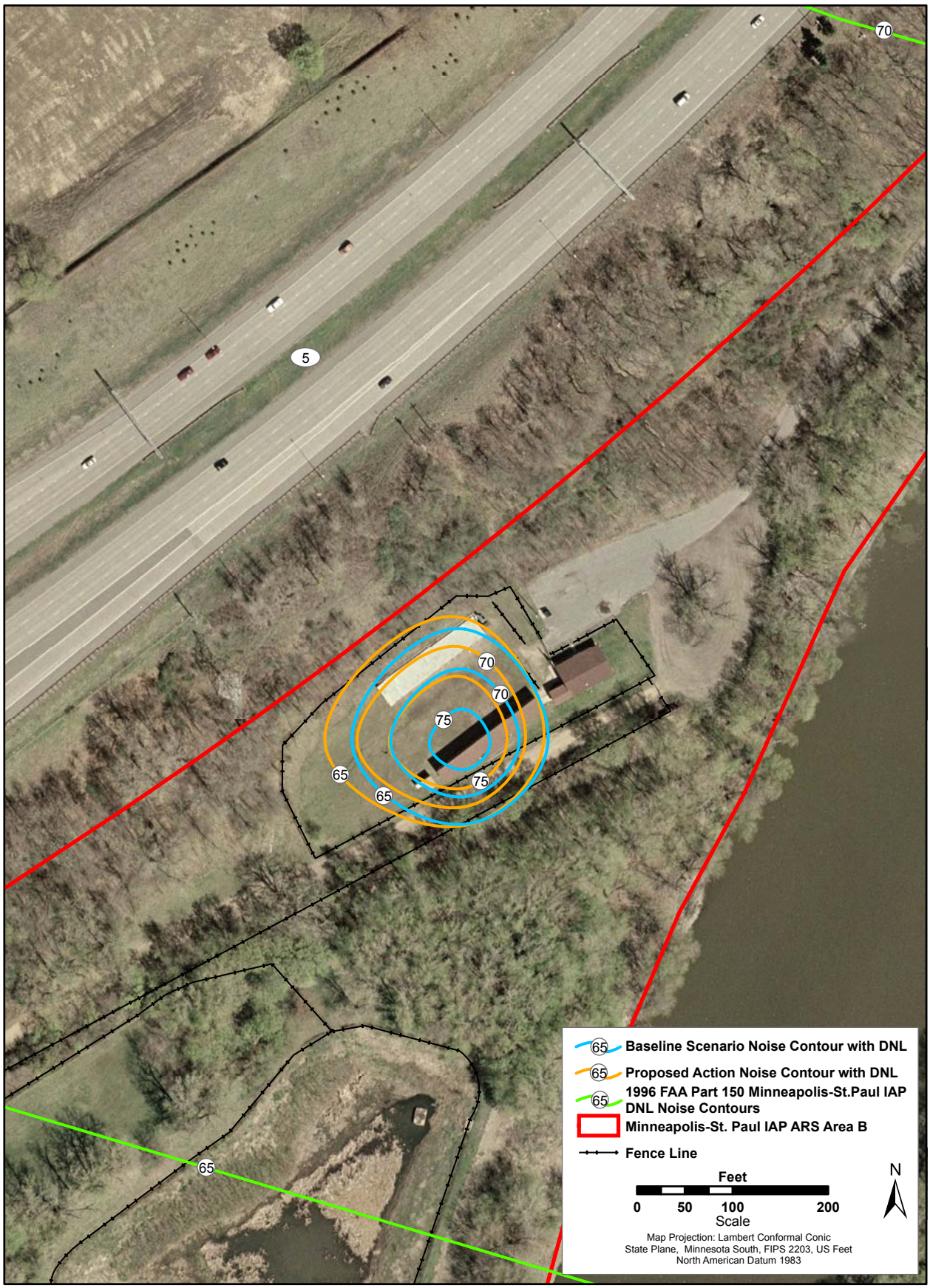


Figure 3-2. Baseline Scenario and Proposed Action Noise Contours on Aerial Photo

Annoyance. Noise can cause a person to be irritated or annoyed. Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. DNL is an accepted metric for quantifying community annoyance to the ambient noise environment, including aircraft noise. **Table 3-2** presents the percentages of people that would be projected to be "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents the results of more than a dozen studies of the relationship between noise and annoyance levels. This relationship was suggested in 1977 by the National Academy of Sciences and was recently reevaluated for use in describing people's reaction to semicontinuous (transportation) noise (Finegold et al. 1994). The data shown provide a perspective on the level of annoyance that might be anticipated. For example, 12 to 22 percent of persons exposed on a long-term basis to DNL of 65 to 69 dBA are expected to be highly annoyed by noise events.

Table 3-2. Percentage of Population Highly Annoyed by NZs

DNL Noise Zones	Percentage of Persons Highly Annoyed	
	Low	High
65–69 dBA	12	22
70–74 dBA	22	36
75–79 dBA	36	54
80+ dBA	>54	

Source: Finegold et al. 1994

3.1.4 Environmental Consequences of the Proposed Action

Minor impacts would be anticipated as a result of the Proposed Action. Sources of noise from the construction and use of the small arms range which could impact populations under the Proposed Action include an increase in intermittent use of the small arms range due to weapons-fire and temporary construction noise.

Construction Noise. The Proposed Action would involve construction activities to demolish and reconstruct the facility, along with modifications to the site itself. Modifications include adding a water supply system, a new restroom, septic system, and communications system. Retention ponds would be constructed to collect runoff from the new facility. Additional information regarding construction activities can be found in **Section 2.1.1**.

Noise from construction activities varies depending on the type of construction being done, the area that the project would occur in, and the distance from the source. The construction projects under the Proposed Action include demolition, paving, and building activities. To predict how the construction activities would impact adjacent populations, noise from the probable construction activities was estimated. For example, as shown on **Table 3-1**, building construction usually involves several pieces of equipment (such as saws and haul trucks) which can be used simultaneously. The cumulative noise from the construction equipment was estimated to determine the total impact of noise from building activities at a given distance. There are no military or civilian populations that reside on Area B. Examples of expected construction noise during the daytime hours are as follows:

- The closest residences to the small arms range are approximately 7,300 feet to the southwest on Highview Avenue. These residences would experience noise levels of approximately 46 dBA from demolition activities.

- Populations 7,300 feet from building activities would experience noise levels of approximately 49 dBA.

- Populations 1,200 feet from building activities would experience noise levels of approximately 65 dBA. No residences currently live within this vicinity.

Implementation of the Proposed Action would have temporary effects on the noise environment from the use of heavy equipment during construction activities. However, noise generation would last only for the duration of construction activities and would be limited to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Noise generated by construction vehicles traveling on I-494 or SR 5 would also be temporary and would likely occur within the same timeframe as the construction itself. Transportation noise impacts are not expected to be significant.

Small Arms Range Noise. Under the Proposed Action, the small arms range would be built to meet the necessary criteria for military and nonmilitary small arms use. As a result, the number of annual rounds fired at the small arms range would increase from approximately 111,000 (which were fired in 2005) to an estimated 139,000. Consequently, noise from the small arms range would increase. Two scenarios were analyzed for noise impacts from the small arms range, the baseline scenario and the Proposed Action.

Under the Proposed Action the NZs would increase from the baseline scenario. As shown in **Table 3-3**, the size of the NZs would increase by a total of only 0.09 acres, or 19 percent, with the largest increase (0.12 acres) occurring in the 75+ DNL NZ in the vicinity of the firing line area. The overall acreage in the 65–69 DNL NZ decreases because it is displaced by the 70–74 DNL and 75+ DNL NZs. Land impacted under the Proposed Action would encompass 0.57 acres, an increase from 0.48 acres under the baseline scenario. As illustrated on **Figure 3-2**, the majority of the NZs would remain within the confines of the small arms range fence line; all of the NZs remain on property owned by the Minneapolis-St. Paul IAP ARS. Therefore no adverse impacts would result from the increased use of the small arms range.

Table 3-3. Change in NZs at the Small Arms Range

DNL NZs	Baseline Scenario (acres)	Proposed Action (acres)	Change in Acres	Percentage Change
65–69 dBA	0.27	0.23	-0.04	-15%
70–74 dBA	0.16	0.17	0.01	6%
75+ dBA	0.05	0.16	0.12	240%
Total	**0.48**	**0.57**	**0.09**	**19%**

3.1.5 No Action Alternative

Under the No Action Alternative, there would be no change in baseline conditions and the Proposed Action would not be implemented. There would be no change to existing noise levels at the small arms range. No adverse impacts on the ambient noise environment would occur under the No Action Alternative.

3.2 Land Use

3.2.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, no nationally recognized convention or uniform terminology for describing land use categories exists. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

3.2.2 Existing Conditions

Land use around the Minneapolis-St. Paul IAP consists mainly of developed property, including residential, industrial, and commercial land uses. Land use around Minneapolis-St. Paul IAP ARS varies since the property is divided into four separate parcels totaling approximately 265 acres. Two of the parcels are at Minneapolis-St. Paul IAP and two parcels are southeast of Minneapolis-St. Paul IAP and SR 5.

The small arms range is on a 26.9-acre parcel, identified as Area B, which is southeast of Minneapolis-St. Paul IAP and SR 5 (934 AW 1996a). Facilities at the small arms range include a control booth, firing line, bullet trap, and a classroom building. The small arms range is surrounded by the Minnesota River to the east, Fort Snelling State Park to the northeast and east, SR 5 to the northwest, and I-494 to the south. Development near the small arms range consists of residential and commercial property to the southeast (south of the Minnesota River), and commercial and industrial land to the southwest. Parkland, vacant land, and open water are to the south and east of the small arms range. Land use around Area B consists of the Minnesota Valley National Wildlife Refuge to the south, Minneapolis-St. Paul IAP to the north, and the Department of Veterans Affairs' Fort Snelling National Cemetery which is adjacent to Minneapolis-St. Paul IAP north of Area B.

3.2.3 Evaluation Criteria

Land use impact analyses monitor the potential for impacts on residential communities. New construction should be compatible with current land use guidelines. Land use can remain compatible, become compatible, or become incompatible. Projected compatibility issues were measured both qualitatively and quantitatively.

The level of potential land use impacts is based on the degree of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use impact would be adverse if it met any of the following criteria:

- Was inconsistent or in noncompliance with existing land use plans or policies
- Precluded the viability of existing land use
- Precluded continued use or occupation of an area
- Was incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflicted with planning criteria established to ensure the safety and protection of human life and property.

3.2.4 Environmental Consequences of the Proposed Action

The Proposed Action would have no impacts on land use. The proposed range would be constructed on existing Minneapolis-St. Paul IAP ARS property in the general footprint of the existing small arms range. The addition of new facilities (e.g., restroom, water supply, septic tank) and retention ponds would not require zoning changes, although adequate permits would need to be procured. The Proposed Action would not change the existing land use in Area B, nor would it impact the land use surrounding it. As discussed in **Section 3.2.2**, the property adjacent to the small arms range consists of open water, SR 5, and Minneapolis-St. Paul IAP ARS. Public safety would not be threatened by the Proposed Action since the Minnesota Valley National Wildlife Refuge is on the opposite side of I-494 and Fort Snelling State Park is on the opposite side of the Minnesota River to the south and about 2,100 feet from the small arms range to the northeast.

The Proposed Action would not require additional 934 AW personnel. Additional organizations could be allowed to use the proposed small arms range, however, these organizations and personnel have utilized the small arms range in the past and reside in the area.

3.2.5 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions and no modifications to the existing small arms range. Construction activities would not occur and the use of the small arms range would remain the same; therefore, the noise contours would remain the same. No land use changes would be anticipated.

3.3 Air Quality

3.3.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed USEPA to develop, implement, and enforce environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide

(SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-4** presents the primary and secondary USEPA NAAQS (USEPA 2006).

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_2.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA. USEPA has delegated the authority for ensuring compliance with the NAAQS to the Minnesota Pollution Control Agency (MPCA). Therefore, the Proposed Action is subject to rules and regulations developed by the MPCA.

USEPA classifies the air quality in an air quality control region (AQCR) or in subareas of an AQCR according to whether the concentration of criteria pollutants in ambient air exceeds the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS, nonattainment indicates that criteria pollutant levels exceed NAAQS, maintenance indicates that an area was previously designated nonattainment but is now attainment, and an unclassifiable air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA Conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Table 3-4. National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
CO			
8-hour Average [a]	9 ppm	(10 mg/m^3)	Primary and Secondary
1-hour Average [a]	35 ppm	(40 mg/m^3)	Primary
NO_2			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
O_3			
8-hour Average [b]	0.08 ppm	(157 µg/m^3)	Primary and Secondary
1-hour Average [c]	0.12 ppm	(240 µg/m^3)	Primary and Secondary
Pb			
Quarterly Average		1.5 µg/m^3	Primary and Secondary
PM_{10}			
Annual Arithmetic Mean [d]		50 µg/m^3	Primary and Secondary
24-hour Average [a]		150 µg/m^3	Primary and Secondary
$PM_{2.5}$			
Annual Arithmetic Mean [e]		15 µg/m^3	Primary and Secondary
24-hour Average [f]		65 µg/m^3	Primary and Secondary
SO_2			
Annual Arithmetic Mean	0.03 ppm	(80 µg/m^3)	Primary
24-hour Average [a]	0.14 ppm	(365 µg/m^3)	Primary
3-hour Average [a]	0.5 ppm	(1,300 µg/m^3)	Secondary

Source: USEPA 2006

Notes: Parenthetical values are approximate equivalent concentrations.

[a] Not to be exceeded more than once per year.

[b] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

[c] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

[d] To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 µg/m^3.

[e] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[f] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m^3.

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, base, or activity) that can emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. However, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. For example, the Title V permitting threshold for an "extreme"

O_3 nonattainment area is 10 tpy of potential VOC or NO_x emissions. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be "significant" if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III [40 CFR 52.21(c)].

3.3.2 Existing Conditions

Minneapolis-St. Paul IAP ARS is in Hennepin County, Minnesota, in the Minneapolis-St. Paul Intrastate (MSPI) AQCR, which comprises seven counties in Minnesota. Hennepin County is classified as a maintenance area for CO and SO_2 and is in attainment for all other criteria pollutants; therefore, the General Conformity Rule applies to the Proposed Action (USEPA 2005).

Minneapolis-St. Paul IAP ARS is classified as a synthetic minor source and has voluntary limits on air emissions. There are various stationary combustion sources at the installation that have the potential to emit, including the installations's boilers, generators, and central heating plant. VOCs are emitted primarily from handling of organic liquids (i.e., refueling activities). There is no routine requirement to monitor pollutant emissions from aircraft operations, government-owned and privately owned vehicles (GOVs and POVs), aircraft engine testing, aerospace ground equipment (AGE), and other sources not included in the state's stationary source permitting program.

Each calendar year, Minneapolis-St. Paul IAP ARS is required to prepare and submit an annual emissions inventory to the MPCA. The purpose of this annual emissions inventory is to estimate and document air pollutant emissions from stationary sources. Stationary source categories include external combustion sources, internal combustion sources, fuel transfer/dispensing, storage tanks, surface coating operations, degreasers/solvent cleaners, aircraft fuel cell maintenance, off-aircraft engine testing, miscellaneous chemical usage, and dust collectors. Air quality emissions inventories for Minneapolis-St. Paul IAP ARS for reporting years 2003, 2004, and 2005 are presented in **Table 3-5**.

Table 3-5. Annual Air Quality Emissions Inventories for Reporting Years 2003, 2004, and 2005

Calendar Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)
2003	7.79	5.35	4.16	2.69	0.65
2004	6.78	5.05	3.42	1.93	0.62
2005	5.65	5.04	3.09	0.34	0.50

Sources: 934 AW 2004, 934 AW 2005b, and 934 AW 2006

3.3.3 Evaluation Criteria

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS "attainment" areas would be

considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Effects on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. **Table 3-6** shows the *de minimis* levels of criteria pollutants for nonattainment areas.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)].

3.3.4 Environmental Consequences of the Proposed Action

Minor adverse impacts on air quality would result from the Proposed Action. As discussed in **Section 3.3.2**, Minneapolis-St. Paul IAP ARS is classified as a maintenance area for CO and SO_2 and is in attainment for all other criteria pollutants; therefore, the General Conformity Rule applies to the Proposed Action. Regulated pollutant emissions from the Proposed Action would not contribute to or affect local or regional attainment status with the NAAQS. The Proposed Action would generate temporary air pollutant emissions. The construction and demolition of the small arms range and associated infrastructure would generate air pollutant emissions as a result of grading, filling, compacting, trenching, and construction operations, but these emissions would be temporary and would not be expected to generate any off-site effects. It is estimated that 0.75 acres of land would be graded during construction of the small arms range and retention ponds.

The construction projects would generate total suspended particulate and PM_{10} and $PM_{2.5}$ (component of PM_{10}) emissions as fugitive dust from ground-disturbing activities (e.g., grading, soil piles) and from combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Table 3-6. Conformity *de minimis* Emission Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
O_3 (measured as NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment/ maintenance	Serious Moderate Not Applicable	70 100 100
SO_2	Nonattainment/ maintenance	Not Applicable	100
NO_x	Nonattainment/ maintenance	Not Applicable	100

Source: 40 CFR 93.153

Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA's AP-42 Section 11.9 dated October 1998 and Section 13.2 dated December 2003. These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays). Using data from the National Oceanic and Atmospheric Administration, the average soil percent moisture was estimated to be 50 percent (NOAA 2006). Wind speed of greater than 12 miles per hour is recorded 34 percent of the time during O_3 season (April 1 to October 31), which is based on average wind rose data and measured speed for Minneapolis, Minnesota (NRCS 2006a).

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment. However, these emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in USEPA's AP-42 Section 11.9 dated October 1998 and Section 13.2 dated December 2003. Proposed construction emissions estimates are included in the total proposed emissions estimates presented in **Table 3-7**. The Proposed Action would generate air emissions well below *de minimus* levels as shown in **Table 3-6**. Since the Proposed Action emissions are well below the *de minimus* values, a formal Conformity Determination is not required. In addition, the Proposed Action would generate emissions well below 10 percent of the emissions inventory for the MSPI AQCR (see **Table 3-7**). Prior to construction activities, the soil contaminated with lead would be remediated in accordance with a clean up plan submitted to MPCA for review and approval. Refer to **Section 3.11.4** for discussion of the remediation approach. Refer to **Sections 3.4.2** and **3.4.4** for general discussions of contractor adherence to OSHA requirements related to construction worker safety. The proposed bullet trap would have a dust collection unit to minimize airborne contamination during range operation following completion of construction activities. The Proposed Action is considered to have an insignificant effect on air quality within the MSPI AQCR and vicinity of Minneapolis-St. Paul IAP ARS.

In summary, minor impacts on regional or local air quality would result from implementation of the Proposed Action and a Conformity Determination would not be required. **Appendix C** provides details for the emissions factors, calculations, and estimates of emissions associated with the Proposed Action.

According to 40 CFR Part 81, there are no Class I areas in the vicinity of the Proposed Action. Therefore, Federal PSD regulations would not apply to the Proposed Action.

Table 3-7. Total Proposed Construction Emissions Estimates from the Proposed Action

Description	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)
Proposed Construction Combustion	0.227	0.124	0.264	0.007	0.008
Proposed Construction Fugitive Dust	--	--	--	--	1.068
Total Construction Emissions	**0.227**	**0.124**	**0.264**	**0.007**	**1.075**
Regional Emissions	153,971	163,699	1,029,245	56,9748	88,088
Percent of Regional Emissions Inventory	0.0001	0.00008	0.00003	0.00001	0.0012

3.3.5 No Action Alternative

Under the No Action Alternative, there would be no change in baseline conditions and no impacts would be expected as the Proposed Action would not be implemented. Impacts from existing activities at Minneapolis-St. Paul IAP ARS would continue to affect the air quality under baseline scenario conditions.

3.4 Safety

3.4.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses (1) workers' health and safety during demolition activities and facilities construction, and (2) public safety during demolition and construction activities and during subsequent operations of those facilities.

Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by the Occupational Safety and Health Administration (OSHA) and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of highly noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for

nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

Range safety violations and unsafe operating conditions must be addressed and corrected as soon as they are identified. The portion of the range in the horizontal plane that is endangered by firing a particular weapon is called the Surface Danger Zone (SDZ). The SDZ includes the area between the firing line and the target line, an impact area, a ricochet trajectory area, and a secondary danger area. The SDZ can also be referred to as a safety fan. The SDZ can also include a weapon back-blast area. The SDZ must be completely within the boundaries of U.S. government-owned or -leased properties.

Clean, hazard-free air is essential for a firing range. OSHA has established the permissible exposure limit (PEL) for airborne lead dust at 50 $\mu g/m^3$ per hour average for an 8-hour day (total daily exposure may not exceed 400 micrograms). Fully contained ranges (indoor and outdoor) must have ventilation systems designed to control exposure from the use of lead-containing ammunition. Lead-free ammunition (LFA) is now available and can be used to eliminate the lead contamination concern with older existing ventilation systems. Only trained personnel wearing proper personal protection can remove lead, and only after consulting with bioenvironmental personnel and following the trap manufacturer's recommended procedures.

3.4.2 Existing Conditions

Construction Safety. All contractors performing construction activities are responsible for following ground safety and OSHA regulations and are required to conduct construction activities in a manner that does not increase risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work. There are emergency services (i.e., police, fire, and ambulance services) at Minneapolis-St. Paul IAP ARS. Emergency situations in the vicinity of the proposed construction and renovation activities can be responded to within a quick timeframe.

Range Safety. The 934 AW small arms range was temporarily closed on 27 July 2004. The subsequent investigation, inspections, and ORM study performed indicated several safety deficiencies that precluded reopening of the range to full mission capability. These deficiencies included an inadequate SDZ, no overhead baffles, no left side containment, and ineffective right side containment, in addition to the fact that projectiles and ricochet could leave the target area and the range itself.

A meeting was held at the request of the 934 AW to discuss the possibility of opening the range for limited mission-essential use until these deficiencies could be corrected. Limited essential use would consist of Group A and just-in-time (JIT) deploying personnel. The ORM process helped reveal several short-term measures to allow the range to open on a limited basis for Group A and JIT personnel. Several long-term measures to mitigate the safety deficiencies were also revealed. Temporary use of the 934 AW range was considered due to the limited availability of local ranges that could accommodate short-notice JIT deploying personnel and the additional time and expense required to keep Group A personnel qualified. Only frangible ammunition is currently used for this training.

Ordnance. Weapons and ammunition are brought to the small arms range by using organizations prior to each training event, and are removed at the conclusion of each training event. There are no weapons or ammunition stored at Area B.

3.4.3 Evaluation Criteria

If implementation of the proposed project were to substantially increase risks associated with the safety of construction personnel, contractors, users of the small arms range, or the local community, or substantially hinder the ability to respond to an emergency, it would represent a significant impact. Impacts were assessed based on the potential effects of construction activities and operations from small arms range activities.

3.4.4 Environmental Consequences of the Proposed Action

Short-term minor adverse construction safety effects and long-term beneficial effects would be expected during construction and renovation projects associated with the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at the small arms range during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to other personnel or to activities at or within the vicinity of the small arms range. Work areas surrounding construction and renovation activities would be fenced and appropriate signs posted to further reduce safety risks to outside personnel. No impacts regarding fire hazards or public safety are expected to occur within the vicinity of the small arms range from construction and renovation projects planned as part of the Proposed Action. Construction personnel could come into contact with small round ammunition and lead-containing soil. A Health and Safety Plan would be completed prior to commencing construction activities on the small arms range.

The Proposed Action would have long-term beneficial effects on the safety of personnel training at the small arms range and would reduce potential for ricochet leaving the target area and small arms range. The Proposed Action would correct all range safety deficiencies and would allow the 934 AW to conduct small arms training to its full mission capabilities.

3.4.5 No Action Alternative

Under the No Action Alternative, limited essential use from Group A and JIT deploying personnel would still be conducted at the small arms range. The range would continue to be in violation of ETL 05-05 requirements for range safety. The current limitations at the range would remain. These include Combat Arms Instructors making students aware of the range deficiencies prior to firing, instructors not allowing students to fire across lanes, the 934 AW conducting more frequent safety spot inspections of the range, and the existing small arms range not meeting criteria for 934 AW personnel to practice with automatic weapons. Therefore, the No Action Alternative would represent an adverse impact on range safety due to the increased potential for an accident to occur because of the continued use of the range in violation of ETL 05-05.

3.5 Geological Resources

3.5.1 Definition of the Resource

Geological resources consist of the earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of physiography and topography, geology, soils, and where applicable, geologic hazards and paleontology.

Physiography and topography pertains to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition. Hydrogeology extends the study of the subsurface to water-bearing structures. Hydrogeological information helps in the assessment of groundwater quality and quantity and its movement.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

The Farmland Protection Policy Act (FPPA) of 1981 and regulatory criteria addressing soil erosion and sediment control and storm water management are discussed in the following text.

Prime farmland is protected under the FPPA (7 CFR Part 658). Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the FPPA is to minimize the extent to which Federal programs contribute to the unnecessary or irreversible conversion of farmland to nonagricultural uses. Determination of whether an area is considered prime farmland and potential impacts associated with a proposed action are based on preparation of the farmland conversion impact rating form AD-1006 for areas where prime farmland soils occur, and by applying criteria established at section 658.5 of the FPPA.

Section 404 of the Clean Water Act (CWA) addresses storm water runoff from construction sites and requires Phase II National Pollutant Discharge Elimination System (NPDES) permits for disturbances between 1 and 5 acres, and Phase I permits for disturbances of more than 5 acres. **Section 3.6** provides a more detailed discussion of Section 404 requirements.

3.5.2 Existing Conditions

Physiography and Topography. Minneapolis-St. Paul IAP ARS is in Hennepin County, Minnesota. Topography of this area typically consists of relatively flat uplands, with elevations ranging from 800 to 850 feet above mean sea level (MSL). Elevations decrease eastward towards the Minnesota River. The Proposed Action would occur on the small arms range of the Minneapolis-St. Paul IAP ARS. The small arms range lies between the Minnesota River on the eastern side and SR 5 on the western side. An escarpment separates the upland area from the lowlands of the project area that parallel the Minnesota River. The topography in the immediate vicinity of the small arms range varies from very steep slopes on the western side to flat floodprone areas on the eastern side. Elevations in this area range from

approximately 700 to 775 feet above MSL along the western banks of the Minnesota River (934 AW 2001).

Geology. Minneapolis-St. Paul IAP ARS lies in the Twin Cities basin, which is a structural depression composed of Precambrian, Cambrian, and Ordovician deposits. The Platteville Limestone Formation lies underneath the soil and consists of a fine-grained limestone with shale partings near the top and base of the formation. The Glenwood Shale Formation underlies the Platteville Limestone. The Glenwood Shale Formation is composed of green sandy shale which is approximately 5 feet thick. The surficial geology in the vicinity of the small arms range consists mainly of floodplain alluvium deposits (934 AW 2001).

Soils. The Dakota, Hubbard, and Estherville series are the dominant naturally occurring soils in the vicinity of the small arms range. These soils in general are loamy and well-drained. The Hennepin County Soil Conservation District indicates that these soils have been altered from their original profiles as a result of development in the area, and are now designated as urban land soil types (934 AW 1996a). Soils mapped on the small arms range include the Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes, frequently flooded; Hawick loamy sand, 18 to 40 percent slopes; Rushriver very fine sandy loam, 0 to 2 percent slopes, occasionally flooded; and Minneiska fine sandy loam, 0 to 2 percent slopes, occasionally flooded. The majority of the soils mapped at the small arms range consist of the Minneiska soil series. The Minneiska soil series occurs in floodplains and consists of a fine sandy loam that is moderately well-drained, and occasionally flooded. The Minneiska fine sandy loam, 0 to 2 percent slopes, occasionally flooded is designated as a prime farmland soil where it has been protected from flooding. The occurrence of prime farmland soil is a necessary component in determining that an area is prime farmland. In addition, the Rushriver component (15 percent) of the Minneiska soil series is designated as a hydric soil (NRCS 2006b). Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen-deficient) conditions in their upper part. Oxygen-deficient soil conditions are conducive to the growth of hydrophytic vegetation that is typically found in wetlands. Locations where these soils occur are also potential locations of wetlands. **Section 3.7** provides additional discussion of wetland habitats occurring in the vicinity of the small arms range. The Rushriver soil series occurs in floodplains and is a very fine sandy loam that is poorly drained, and occasionally flooded. The Hawick loamy sand occurs on the escarpment (western side of the small arms range) and consists of loamy sand which is excessively drained. A small area on the northeastern side of the range is mapped as the Muskego, Blue Earth, and Houghton soil series. This soil mapping unit occurs in floodplains and is composed of very poorly drained silt loam or muck that is frequently flooded (NRCS 2006b). All three soils occurring in this mapping unit are designated as hydric soils.

Some soils occurring in the vicinity of the small arms range have been contaminated in association with past use of the area as a firing range. **Section 3.11** provides a discussion of contaminated soils in the vicinity of the small arms range.

3.5.3 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Analysis of potential impacts on geological resources typically includes the following steps:

- Identification and description of resources that could potentially be affected

- Examination of a proposed action and the potential effects the action could have on the resource
- Assessment of the significance of potential impacts
- Provision of mitigation measures in the event that potentially significant impacts are identified.

Impacts on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function within the environment.

3.5.4 Environmental Consequences of the Proposed Action

Physiography and Topography. Minor long-term adverse effects would be expected on the natural topography of the small arms range as a result of the demolition, construction, and site preparation under the Proposed Action. Implementation of the Proposed Action would likely require grading and leveling of the existing topography to prepare the site for redevelopment. The majority of the project development would take place in the footprint of the existing small arms range, thereby minimizing impacts on previously undisturbed topography.

Geology. Minor long-term adverse effects on geologic resources would be expected as a result of implementing the Proposed Action. Minor impacts would be expected to occur as a result of grading, excavating, and recontouring of the soil necessary to prepare the site for redevelopment. The geology of the construction site would be impacted as a result of the site preparation activities, the construction of the gravel access road, and the addition of water and septic system. The majority of new development under the Proposed Action would occur in the footprint of the existing small arms range, thereby minimizing impacts on previously undisturbed geologic resources.

Soils. Minor short- and long-term adverse effects on soils would be expected as a result of demolition and construction under the Proposed Action. Construction activities would be expected to directly impact the existing soils as a result of grading, excavation, placement of fill, compaction, mixing, or augmentation necessary to prepare the site for redevelopment. Additional impacts on soils could occur as a result of erosion if properly designed erosion and sediment controls and storm water management practices were not implemented during site development. Minor adverse impacts on adjacent habitats could also result from the deposition of soils eroded from the development site during construction. However, properly designed erosion and sediment control and storm water management practices would be implemented to minimize potential adverse impacts.

There would be a slight increase in impervious area resulting from the proposed construction of the 12,002 ft^2 concrete pad within the small arms range. Implementation of storm water best management practices (BMPs) designed to properly store and convey increased runoff (i.e., retention ponds) would minimize any adverse effects associated with the increased area of impervious surfaces.

No adverse effects on prime farmland would occur as a result of implementing the Proposed Action. The Minneiska fine sandy loam, 0 to 2 percent slopes, occasionally flooded, which occurs at the small arms range, is designated as a prime farmland soil in other areas where it has been protected from flooding. Flood protection practices (e.g., levees, flow diversion channels) have not been implemented to protect the Minneiska fine sandy loam from flooding at the small arms range, and therefore the soil would not be considered prime farmland soil in the project area. In addition, new development associated with the Proposed Action would occur in an area that is almost entirely within the footprint of an existing structure. By definition, an area that is designated as prime farmland has to be available for agricultural uses (see **Section 3.5.2**). The location of the Proposed Action is currently developed and not available for agricultural uses.

3.5.5 No Action Alternative

Under the No Action Alternative, no change in baseline conditions would occur and Minneapolis-St. Paul IAP ARS would not implement the Proposed Action. As a result, there would be no effects on geological resources under the No Action Alternative.

3.6 Water Resources

3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

Groundwater. Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface Water. Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Proper management of storm water flows, which can be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality. Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. Various systems and devices can be designed to control increased storm water volume and velocity and reduce potential adverse effects associated with increased impervious surfaces. Properly designed storm water systems can also provide the benefit of reducing sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding. Higher densities of development, such as those found in urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban areas.

The CWA (33 U.S.C. 1251 et seq., as amended) establishes Federal limits, through the NPDES, on the amounts of specific pollutants that are discharged to surface waters to restore and maintain the chemical, physical, and biological integrity of the water. A Phase II NPDES permit would be required for any change in the quality or quantity of wastewater discharge or storm water runoff from construction sites where 1 to 5 acres would be disturbed, and a Phase I permit would be required for disturbances of more than 5 acres. Section 404 of the CWA regulates the discharge of fill material into waters of the United States.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Such lands might be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities, such as hospitals, schools, or storage buildings for irreplaceable records, are usually not sited in either the 100- or 500-year floodplain. Federal, state, and local regulations often limit floodplain development to passive

uses, such as recreational and preservation activities, to reduce the risks from flooding to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988. The process is outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*. As a planning tool, the NEPA process incorporates floodplain management through analysis and public coordination of the EA.

3.6.2 Existing Conditions

Ground Water. There are three aquifers in the vicinity of the Minneapolis-St. Paul IAP ARS, the upper artesian aquifer, the St. Peter aquifer, and the Prairie du Chien-Jordan aquifer. The upper artesian aquifer is 70 to 80 feet below the surface. It lies in a layer of the Platteville Limestone Formation and drains to the Minnesota River. The Glenwood Shale, which lies beneath the Platteville Formation, caps the St. Peter aquifer. The Prairie du Chien-Jordan aquifer lies approximately 500 feet below the surface beneath four layers of bedrock. Both the St. Peter and the Prairie du Chien-Jordan aquifers have high quality water (934 AW 2001).

Surface Water. There are no major surface water bodies on the Minneapolis-St. Paul IAP ARS. The largest surface water body adjacent to the installation is the Minnesota River which lies east of the small arms range. There is also a retention pond on Minneapolis-St. Paul IAP ARS property which is used by Minneapolis-St. Paul IAP. Surface water on the installation drains east to the Minnesota River via drainage ditches (MSPAFR 2001).

The Critical Areas Act of 1973 (Minn. Stat. § 116G.01) was enacted by the Minnesota legislature to provide the state with a means to protect areas possessing important historical, cultural, or aesthetic values, or natural systems that perform functions of greater than local significance. As a result of the act, the Mississippi National River and Recreation Area (MNRRA) was established in 1988 to protect and preserve an area that is significant to the ecology, culture, politics, and history of the United States. Surface water from the installation drains into a section of the Minnesota River that is a part of the MNRRA. The MNRRA, at approximately 54,000 acres, contributes to protecting natural and cultural resources of the Mississippi River and stretches along 72 miles of the river. Approximately 35 acres of MNRRA is owned by the National Park Service; the remaining property is owned by the local municipalities. The small arms range is within the boundaries of MNRRA and in the jurisdiction of Hennepin County. Consequently, Minneapolis-St. Paul IAP ARS is required to abide by Hennepin County's Critical Area Plan. However, Hennepin County currently does not have a Critical Area Plan.

Floodplains. The 100-year floodplain of Area B is approximately 715 feet above MSL (see **Figure 3-3**). A portion of the small arms range lies on the upland edge of the 100-year floodplain, however based on the Flood Insurance Rate Map (FIRM) number 27053C0477E for Hennepin County, Minnesota, the eastern area, and majority of the small arms range, lies within the 100-year floodplain (FEMA 2004). The area periodically experiences extreme flooding (934 AW 1996a).

The *Wetland Delineation Report* conducted in April 1996 found three wetland areas in Area B. See **Section 3.7** for a discussion of wetlands.

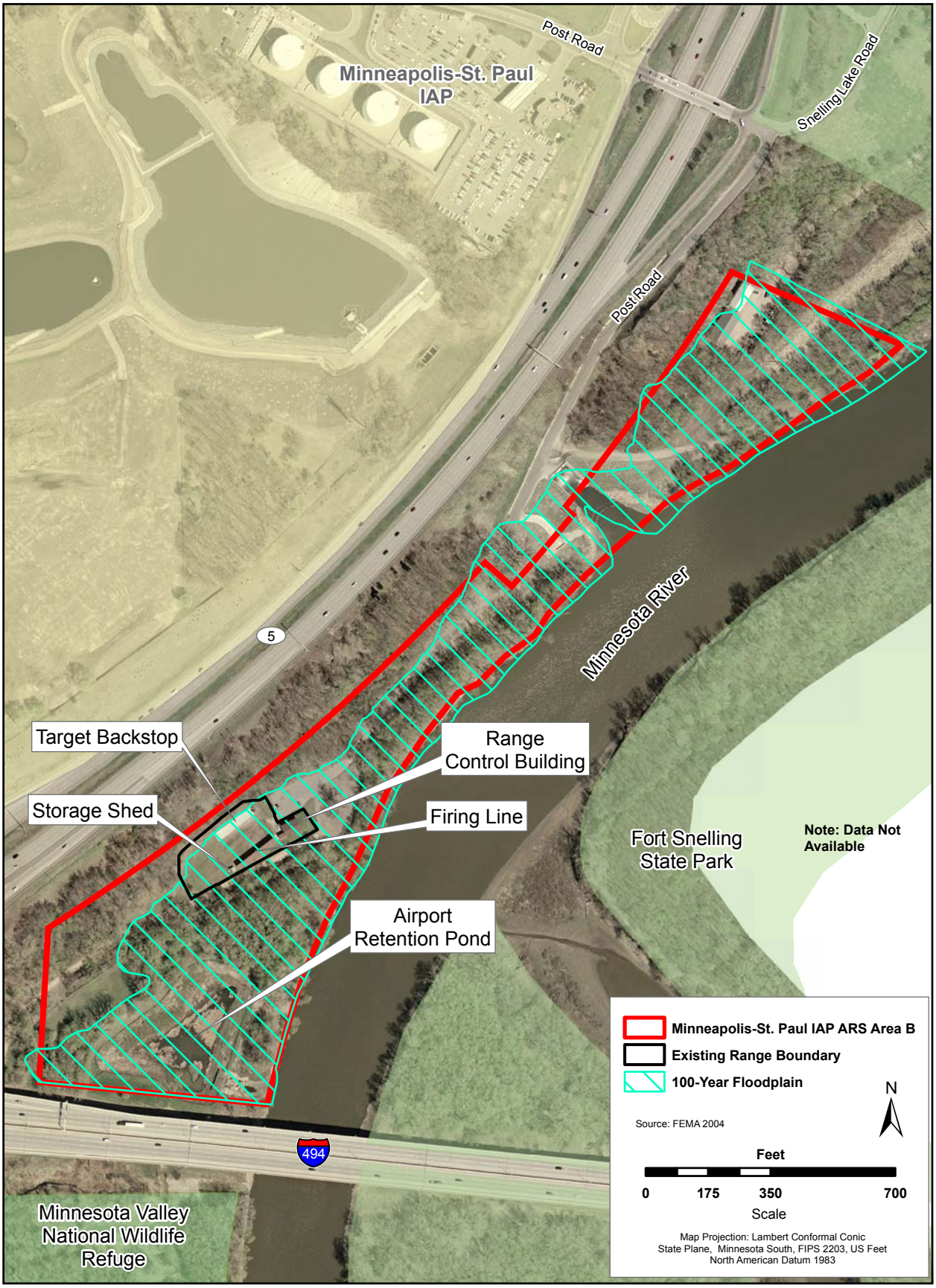


Figure 3-3. 100-Year Floodplain of Area B

3.6.3 Evaluation Criteria

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. The Proposed Action would have adverse effects on water resources if it were to result in one or more of the following:

- Reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Affect water quality adversely
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

3.6.4 Environmental Consequences of the Proposed Action

Ground Water. Short-term minor adverse effects on ground water quality would be expected during site demolition and construction. Implementation of storm water BMPs would minimize potential spill or runoff-related impacts on ground water.

Surface Water. Implementation of the Proposed Action would be expected to have minor adverse effects on surface water volume and quality. The small arms range is on the western floodplain of the Minnesota River, which is the closest surface water feature to the proposed development area. A minor increase in the conveyance of nonpoint source pollutants in runoff to the Minnesota River could occur in association with construction and demolition activities. No effect on aquatic habitats occurring downstream of the small arms range is anticipated as a result of implementation of the Proposed Action. Soil disturbance under the Proposed Action is anticipated to be less than 1 acre, therefore a NPDES permit for storm water runoff from construction sites would not be required. The Proposed Action would increase the amount of impervious surfaces; however, the Proposed Action includes the construction of two retention ponds thereby alleviating the increase of storm water runoff. Beneficial effects on storm water management would be expected as a result of the two retention ponds.

Adherence to proper engineering practices and implementation of storm water BMPs developed consistent with applicable codes and ordinances would minimize runoff-related impacts and the potential for adverse effects on surface water quality. In addition, the potential for increased conveyance of construction debris and nonpoint source pollutants to the river would be minimized by implementing applicable storm water BMPs. The 934 AW is committed to the use of appropriate BMPs including: installation and maintenance of a silt fence on the down-slope perimeter of the area disturbed by construction and around any soil stockpiles; installation and maintenance of a temporary straw bale check dam at the retention basin discharge point prior to installation of permanent rip-rap; protection of construction ingress and egress to prevent deposition of sediment on public roads; and temporary stabilization of disturbed areas with slopes greater than 3:1 or disturbed areas not actively being worked. BMPs are incorporated into final project specifications and drawings.

As previously mentioned, Hennepin County does not have a Critical Area Plan. However, regulations set forth by the National Park Service in the *Final Comprehensive Management Plan for the Mississippi National River and Recreation Area* to protect and ensure the preservation of the MNRRA would be followed. In addition, restrictions outlined in the *Minneapolis Critical Area Plan* that were approved on 16 June 2006 would be implemented. These include building height restrictions, the preservation of the riverbank, BMPs for storm water management, and the use of natural screening to limit the site of the small arms range from the opposing bank and river surface.

Floodplains. Long-term minor to moderate adverse effects associated with the 100-year floodplain would be expected as a result of implementing the Proposed Action. A portion of the small arms range lies on the upland edge of the 100-year floodplain, while the eastern area, and majority of the small arms range lies within the 100-year floodplain. Minor to moderate impacts would be associated with the expansion of the proposed small arms range, including the restroom, retention ponds, and the concrete pad. In addition, a section of the existing gravel road southeast of the small arms range would be realigned. These minor modifications are expected to have minor to moderate effects on the current floodplain volume, area, and flow characteristics. Since the small arms range is in and immediately adjacent to the 100-year floodplain, there is a higher potential for minor to moderate adverse effects associated with erosion and sedimentation downstream in the event of a high volume storm event or flooding during site demolition and construction. Properly designed erosion and sediment controls and storm water BMPs would be implemented during demolition and construction to minimize potential adverse impacts. Construction within the 100-year floodplain under the Proposed Action would be designed and implemented consistent with the provisions of EO 11988, *Floodplain Management*. Examples of such provisions include the elevation of structures above the flood level, designing structures to reduce the affected surface volume displaced, and the incorporating of FEMA-approved flood-proofing and flood protection measures.

3.6.5 No Action Alternative

Under the No Action Alternative, there would be no change in baseline conditions and Minneapolis-St. Paul IAP ARS would not implement the Proposed Action. As a result, there would be no effects on water resources under the No Action Alternative.

3.7 Biological Resources

3.7.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (i.e., wetlands, forests, and grasslands) in which they exist. Sensitive and protected biological resources include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat, as rare habitats are sensitive and can be protected at the state level without being federally designated critical habitat under the Endangered Species Act (ESA); species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant area of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. Candidate species are plants and animals for which the United States Fish and Wildlife Service (USFWS) has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a listing regulation is precluded by other higher-priority listing activities. Although candidate species

receive no statutory protection under the ESA, the USFWS advises that the species are at risk and might warrant protection under the ESA in the future.

The United States Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328). Wetlands are important natural systems and habitats because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat and unique flora and fauna niche provisions, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats including wetlands.

3.7.2 Existing Conditions

Vegetation. The small arms range is classified as semi-improved grounds and is characterized primarily by maintained and mowed vegetation. Vegetation in the vicinity of the small arms range is primarily classified as Floodplain Forest, Silver Maple Subtype. A secondary classification, for some limited portions of Area B not included within the small arms range, is Emergent Marsh, Mixed Emergent Marsh. The Floodplain Forest, Silver Maple Subtype, is characterized as lowland forests that occur on seasonally flooded alluvial soils on river bottoms along larger rivers. The canopy often consists of a tall, open supercanopy of cottonwood *(Populus deltoides)* above a continuous canopy of silver maple *(Acer saccharinum)*. The Emergent Marsh, Mixed Emergent Marsh type is characterized as open, flooded wetlands on mineral or shallow organic soils at lake or river margins. Persistent emergent vegetation dominates, often in a mosaic of single-species patches; dominant species are primarily river bulrush *(Scirpus fluviatilis)* and cattails *(Typha* spp.*)*. Common associated plants are broad-leaved arrowhead *(Sagittaria latifolia)* and sweetflag (*Acorus americanus)* (934 AW 2001).

Wildlife. Mammalian species that might be found in the vicinity of the small arms range include the striped skunk (*Mephitis mephitis*), Eastern cottontail rabbit (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), Eastern gray squirrel (*Sciurus carolinensis*), and raccoon (*Procyon lotor*). Avian species might include the killdeer (*Charadrius vociferous),* American crow *(Corvus brachyrhynchos)*, black-capped chickadee *(Poecile atricapillus),* and the European starling *(Sturnus vulgaris)*. Other species might include the common garter snake (*Thamnophis sirtalis*) and the American toad (*Bufo americanus*) (934 AW 2001).

Protected Species. The bald eagle (*Haliaeetus leucocephalus*) which is federally threatened and state-listed as a species of special concern occurs to the northeast of the small arms range on Fort Snelling State Park property. Correspondence from USFWS (dated 13 July 2006) indicated there are no records of bald eagle nest sites or other federally listed species in the general vicinity of the Proposed Action (see **Appendix B**). There are no Federal- or state-listed flora species occurring in the vicinity of the Proposed Action (934 AW 2001).

Wetlands. A wetland survey was conducted on 30 April 1996 to identify the presence and boundaries of regulated wetlands and other waters of the United States in Area B (934 AW 2001). Three wetland areas were identified in Area B based on the review of USFWS National Wetland Inventory maps and the onsite delineation. One wetland (Wetland 1) is present towards the northern end of Area B and seems to have been formed by a small intermittent drainageway that empties into the Minnesota River. The wetland is characterized as a palustrine, emergent, seasonally flooded habitat. The second wetland

(Wetland 2) is just to the north of Wetland 1 and is characterized as a riverine, lower perennial, unconsolidated bottom, permanently flooded wetland. This wetland has very steep banks and consists of mostly open water, adjacent to the Minnesota River. Wetland 2 has been created primarily as a result of dredging and is surrounded by fill and dredged material (934 AW 1996b). The third wetland (Wetland 3) delineated in the 1996 survey occurs in association with the upper bank of the Minnesota River along the eastern boundary of Area B. The riverbank represents the upland extent of wetlands occurring in association with the Minnesota River. Individual boundaries of wetlands occurring within the river bank were not delineated, but are characterized primarily by forested, broad-leaved deciduous, seasonally flooded habitats.

The Proposed Action is in the vicinity of these wetland areas. The 1996 wetland survey did not identify any wetlands within or immediately adjacent to the existing small arms range. A wetland delineation has not been conducted on the installation since the 1996 survey (934 AW 2001).

3.7.3 Evaluation Criteria

The significance of effects on 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 effects. A habitat perspective is used to provide a framework for analysis of general classes of effects (i.e., removal of critical habitat, noise, human disturbance). The effects on biological resources are significant if species or habitats of high concern are adversely affected over relatively large areas. Effects are also considered significant if disturbances cause reductions in the population size or distribution of a protected species or a species of high concern.

Ground disturbance and noise associated with construction activities might directly or indirectly cause potential effects on biological resources. Direct effects from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats might be effects associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. To evaluate effects, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the area of potential effect to total available habitat within the region, type of stressors involved, and magnitude of the effects.

3.7.4 Environmental Consequences of the Proposed Action

Vegetation. Minor adverse effects on vegetation would be expected as a result of implementing the Proposed Action. The Proposed Action would occur primarily within the footprint of the existing small arms range. Additional disturbance would occur in association with construction of the retention ponds, the realignment of a small section of the gravel road, and along the alignment of the proposed communication and water lines. The construction activities would predominately affect improved and semi-improved areas. Vegetation in these areas is characterized primarily by maintained and mowed habitats. Permanent loss of mowed vegetation would occur in association with the proposed 12,002 ft^2 concrete pad between the firing line and the target line. Additional disturbed areas would be replanted with native vegetation or approved grass mixtures following development activities.

Wildlife. Under the Proposed Action, minor adverse effects would be expected on wildlife from an increase in noise associated with increased use of the small arms range. Short-term minor effects would occur on wildlife as a result of temporary noise disturbances associated with construction activities. Some mortality of small less-mobile species could occur as a result of a collision with construction equipment. Efforts would be made during construction to allow less-mobile species to avoid impacts from construction equipment. Efforts would also be made to avoid impacts on wildlife occurring in the vicinity of development activities. Most wildlife occurring in the vicinity of the small arms range would be expected to move to adjacent habitats during site development. Some wildlife species occurring in the vicinity of the small arms range would be expected to have adapted to the variety of noise levels associated with range and airport activities and would likely move back into the area following site development.

Under the Proposed Action, negligible adverse effects would be expected on wildlife as a result of the proposed retention ponds. The proposed retention ponds would not be expected to attract wildlife. The proposed ponds would not be built as vegetative treatment systems or detention ponds, which hold water. The proposed ponds would be built as retention ponds, which do not hold water for long periods of time, and therefore minimize potential attraction of wildlife.

As discussed in **Section 3.11.4**, lead-contaminated soil would be removed from the identified contaminated site and disposed of off-site in accordance with MPCA regulations before the proposed construction would begin. Therefore, it is anticipated that the construction site would be remediated to acceptable levels per MPCA requirements before the retention ponds would be built. In addition, the proposed bullet trap in the small arms range would be designed to be "lead-safe" and improvements in the walls and floors would deflect bullets into the bullet trap. The amount of lead particles from the proposed small arms range would be expected to be minimal since the bullet trap and facility would capture the majority of the bullet fragments. The bullet traps and the traps in the retention ponds would be monitored and cleaned out periodically to prevent potential lead or other particle build-up. As a result, it is unlikely that waterfowl would ingest any lead particles from the retention ponds.

Protected Species. No effects on bald eagles would be expected as a result of implementing the Proposed Action. According to the USFWS, there are no records of bald eagle nest sites or other federally listed species in the general vicinity of the Proposed Action (see **Appendix B**). Bald eagles are documented to occur to the northeast of the small arms range on the Fort Snelling State Park property. Occurrence of bald eagles in the vicinity of the small arms range would be expected to be transient in nature, or associated with foraging along the Minnesota River. It is not anticipated that implementation of the Proposed Action would adversely affect bald eagles.

Wetlands. The 1996 wetland survey did not identify any wetlands within or immediately adjacent to the existing small arms range. A site-specific wetland delineation and Jurisdictional Determination from the USACE would be required if it is determined that wetlands might occur in close proximity to the Proposed Action. Wetlands occurring in proximity of the proposed small arms range, road realignment, or communication and water line alignments would be avoided to the maximum extent practicable and any unavoidable impacts would be minimized and mitigation would be implemented, as required, for any unavoidable impacts.

Implementation of properly designed and maintained erosion and sediment controls and storm water BMPs during construction would minimize potential for any adverse effects on wetlands occurring in proximity to the small arms range. Implementation of BMPs would minimize the potential for adverse effects associated with runoff from the construction of the proposed small arms range (e.g., reduction in water quality, wildlife habitat, and nutrient cycling).

3.7.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and there would be no change in baseline conditions. As a result, there would be no effects on biological resources under the No Action Alternative.

3.8 Cultural Resources

3.8.1 Definition of the Resource

Cultural resources is an umbrella term for many heritage-related resources. The National Historic Preservation Act (NHPA) of 1966, as amended, applies to "historic properties" defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register, including artifacts, records, and material remains related to such a property or resource. Depending on the condition and prehistoric or historic use, such resources might provide insight into lifestyles and living conditions in previous civilizations or might retain cultural and religious significance to modern groups.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA, the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990), which requires consultation with interested Native American tribes for disposition of human remains and artifacts of cultural patrimony.

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing); architectural resources (buildings, structures, groups of structures, or designed landscapes that are of historic or aesthetic significance); or properties of traditional, cultural, or religious significance to Native American tribes.

Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered eligible for the National Register of Historic Places (NRHP). More recent structures, such as Cold War-era resources, might be eligible for the NRHP if they are considered to be of exceptional importance and have the potential to gain significance in the future. Historic districts have a significant concentration, linkage, or continuity of historic sites, buildings, structures, or objects united historically or aesthetically.

Traditional cultural properties (TCPs) can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

The EA process and the consultation process prescribed in Section 106 of the NHPA require an assessment of the potential impact of an undertaking on historic properties that are within the proposed project's Area of Potential Effect (APE), which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to locate and inventory all resources under their purview that are recommended as eligible for inclusion in the NRHP on owned, leased, or managed property.

3.8.2 Existing Conditions

For the purpose of this EA, the APE for impacts on archaeological resources or TCPs under the Proposed Action is defined by the limits of the existing footprint of the small arms range. Archaeological surveys completed in 1995 in support of the *Cultural Resources Survey Report* (MSPARS 1995) and in 2000 in support of the Final EA completed for the *Drainage Improvement Project at the Minneapolis-St. Paul IAP ARS* did not encounter any intact archaeological sites or features within the APE. As part of the Final EA completed for the *Drainage Improvement Project* at the Minneapolis-St. Paul IAP ARS, identification of the project area as a potential TCPs was investigated through coordination with federally recognized Native American Tribes in Minnesota. The Leech Lake Band of Ojibwe documented that it had no concerns regarding sites of religious or cultural significance within the APE. No other federally recognized tribes provided any response (MSPAFR 2001).

For the purposes of this EA, the APE for impacts on historic buildings under the Proposed Action is the small arms range. The proposed construction actions would take place within the existing footprint of the small arms range, outside of the limits of the Fort Snelling Historic District and the Fort Snelling National Cemetery, and at a sufficient distance that the construction would not have a visual impact on these resources. The APE includes the 1,300-square-foot combat arms training maintenance building (i.e., Building 400) and two range supply and equipment storage buildings (i.e., Buildings 401 and 402), all of which were built between 1985 and 1990 (MSPAFR 2001).

3.8.3 Evaluation Criteria

Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

3.8.4 Environmental Consequences of the Proposed Action

The Proposed Action would have no impacts on cultural resources. The APE lies entirely within the footprint of the small arms range; therefore, as discussed in **Section 3.8.2**, there would be no direct impact on archaeological resources as a result of implementing the Proposed Action.

None of the buildings discussed in **Section 3.8.2** satisfy the NRHP eligibility criteria. No TCPs have been identified within the APE and, although two potential TCPs are within the general vicinity of the APE, the Proposed Action would not impact those resources.

The only potential resource of concern within the APE is the small arms range itself. The exact origin of the small arms range before 1951 is unknown to Base Historians (Canarr 2005). A larger range is shown to the south and west of the APE on maps of the area printed in 1927 and 1936. This larger range was constructed by the Army, potentially as early as the 1860s, and was used by the Army and Navy for training during and after World War II (Canarr 2005). In 1969, the USACE shifted the channel of the Minnesota River to the west, cutting through much of the larger range. No portion of the original range remains on the west side of the river. The small arms range (current APE) might have been constructed immediately prior to World War II to augment the larger range; however, all that is known for sure regarding the APE is that it was in its current position and basic configuration when the USAF took control of the property in 1951. It has, with one exception, remained in the same configuration for the past 53 years. The exception is that in August 1995 the earthen backstop was mined for lead and a new

Action Target's metal backstop was installed (Canarr 2005). While the long history of use of this range might lend it increased significance, documentation regarding the history of the small arms range and its pre-1951 configuration is scarce, and archaeological surveys of the parcel have not yielded artifacts or features diagnostic of these previous periods of use. Accordingly, it is considered unlikely that the small arms range would meet the NRHP eligibility criteria for a historic landscape. The small arms range also is not considered a contributing element to the Fort Snelling Historic District or Fort Snelling National Landmark.

The Proposed Action would not physically alter, damage, or destroy all or part of a resource; alter characteristics of the surrounding environment that contribute to the resource's significance; introduce visual or audible elements that are out of character with the property or alter its setting; neglect the resource to the extent that it deteriorates or is destroyed; or result in the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance. The Proposed Action would have no impacts on cultural resources.

3.8.5 No Action Alternative

Under the No Action Alternative, there would be no change in baseline conditions and Minneapolis-St. Paul IAP ARS would not implement the Proposed Action. There would be no effects on cultural resources under the No Action Alternative.

3.9 Socioeconomics and Environmental Justice

3.9.1 Definition of Resource

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators are typically accompanied by changes in other components, such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Data in three areas provide key insights into socioeconomic conditions that might be affected by a proposed action. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" effects of any jobs created or lost as a result of a proposed action. Data on industrial or commercial growth or growth in other sectors provide baseline and trend line information about the economic health of a region.

In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and jobs base.

Demographics identify the population levels and changes to population levels of a region. Demographics data might also be obtained to identify, as appropriate to evaluation of a proposed action, a region's characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators.

Socioeconomic data shown in this section are presented at metropolitan, county, and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends. Data have been collected from previously published documents issued by Federal, state, and local agencies; and from state and national databases (e.g., U.S. Bureau of Economic Analysis' Regional Economic Information System). For the purposes of this EA some census tracts were omitted from analysis because of their considerable distance from the Proposed Action.

Environmental Justice. There are no Federal regulations on socioeconomics, but there is one EO that pertains to environmental justice issues. This EO is included in the environmental justice section because it relates to various socioeconomic groups and the health effects that could be imposed on them. On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

3.9.2 Existing Conditions

Minneapolis-St. Paul IAP ARS, to the north and east of Minneapolis-St. Paul IAP, encompasses approximately 265 acres owned by the USAF. The Minneapolis-St. Paul IAP is owned and operated by the Metropolitan Airports Commission. Minneapolis-St. Paul IAP is on 3,020 acres near the intersection of the Minnesota and Mississippi Rivers in Hennepin County, Minnesota. Minneapolis-St. Paul IAP is bounded on the north by the city of Minneapolis, on the west by the city of Richfield, on the south by the city of Bloomington, and on the east by the Minnesota River, which also serves as the boundary between Hennepin and Dakota counties. The city of St. Paul is a short distance northeast of Minneapolis-St. Paul IAP in Ramsey County (934 AW 1996a). For the purposes of this EA, the Region of Influence (ROI) includes Census Tracts 250 (which contains Minneapolis-St. Paul IAP), 251, 606.05, and 607.25.

Hennepin and Dakota counties, which contain the Minneapolis-St. Paul Metropolitan Statistical Area (MSA), experienced an 8.1 and 29.3 percent population increase respectively from 1990 to 2000. The State of Minnesota during that time span had a population increase of 12.4 percent. However, since 2000 the populations of Minneapolis and St. Paul have dropped. From April 1, 2000, to July 1, 2003, both Minneapolis and St. Paul have experienced a decrease of 2.5 and 2.2 percent in population, respectively (U.S. Census Bureau 2006). Some of the population decrease in Minneapolis-St. Paul is being attributed to expansion of the suburbs and outer areas surrounding the cities which have experienced population increases (Williams 2006).

Employment Characteristics. The Minneapolis-St. Paul MSA is home to some of the largest financial and manufacturing companies in the world, including 3M, General Mills, Cargill, Norwest Corporation, and Pillsbury. The MSA is in the southeastern part of central Minnesota and has become a transportation hub and commercial center for the upper Midwest (934 AW 1996a). The Minneapolis-St. Paul IAP ARS has had a positive impact on the Minneapolis-St. Paul MSA. In Fiscal Year 2003, the installation had approximately $40 million in salaries and approximately $24 million in construction services, supplies,

equipment, travel, and per diem. The overall economic impact of the installation on the MSA was approximately $90 million in 2003 (934 AW 2005a).

Table 3-8 shows employment by industry for the ROI, Hennepin and Dakota counties, and the State of Minnesota. Employment types in the ROI vary with the largest employment type by industry in educational, health, and social services. The manufacturing industry is one of the larger employment types in the ROI. The unemployment rates in Minnesota and MSA for May 2006 were 3.7 and 3.1, respectively (BLS 2006).

Table 3-9 shows demographic characteristics of the ROI, Hennepin and Dakota counties, and Minnesota. Both the ROI and Hennepin and Dakota counties have a slightly higher percentage of African Americans and Asians than the statewide average. Fewer people live below the poverty level in the ROI compared to Hennepin and Dakota counties and Minnesota. Similarly, the per capita income of residents in the ROI is higher than in Hennepin and Dakota counties and Minnesota.

Table 3-8. Employment by Industry

Employment by Industry	Region of Influence [a]	Hennepin and Dakota Counties	State of Minnesota
Percent of Employed Persons in Armed Forces	0.7	0.1	0.1
Industry of Civilian Labor Force			
Agriculture, forestry, fishing and hunting, and mining	0.7	0.4	2.6
Construction	4.7	4.7	5.9
Manufacturing	12.0	13.8	16.3
Wholesale trade	3.8	4.2	3.6
Retail trade	12.1	11.8	11.9
Transportation and warehousing, and utilities	7.4	6.6	5.1
Information	3.8	3.2	2.5
Finance, insurance, real estate, and rental and leasing	10.8	10.2	7.2
Professional, scientific, management, administrative, and waste management services	11.3	12.1	8.8
Educational, health, and social services	17.0	18.0	20.9
Arts, entertainment, recreation, accommodation, and food services	7.7	7.2	7.2
Other services (except public administration)	3.6	4.5	4.6
Public administration	3.1	3.0	3.4

Source: U.S. Census Bureau 2000

Note: [a] Employment data are not reported for Census Tract 250 which contains Minneapolis-St. Paul IAP ARS, therefore it is not included as part of ROI data for this table.

Table 3-9. Race and Poverty Characteristics

	Minnesota	Hennepin and Dakota Counties	ROI [a]
Total Population	4,919,479	1,472,104	7,939
Percent White	89.4	86.0	87.5
Percent Black or African American	3.5	5.6	5.2
Percent American Indian, Eskimo, or Aleut	1.1	0.5	0.7
Percent Asian	2.9	3.8	3.6
Percent Native Hawaiian and Other Pacific Islander	0.0	0.0	0.1
Percent other	1.3	1.7	1.3
Percent reporting 2 or more races	1.7	2.2	1.6
Percent below poverty	5.1	3.7	1.9
Per Capita Income	$23,198	$27,898	$29,284
Median Household Income	$47,111	$56,787	$53,467

Source: U.S. Bureau of Census 2000

Note: [a] Percent below poverty, per capita income, and median household income are not reported for Census Tract 250, thus this information is not included as part of the data that were reported for the ROI.

3.9.3 Evaluation Criteria

The importance of construction expenditures are assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The relative magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might go unnoticed in an urban area, but could have considerable impacts in a rural region. If potential socioeconomic changes were to result in substantial shifts in population trends or a decrease in regional spending or earning patterns, they would be considered adverse. The proposed action could have a significant effect with respect to the socioeconomic conditions in the surrounding ROI if it were to result in any of the following:

- Change the local business volume, employment, personal income, or population that exceeds the ROI's historical annual change
- Adversely affect social services or social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates
- Disproportionately impact minority populations or low-income populations.

3.9.4 Environmental Consequences of the Proposed Action

Socioeconomics. The Proposed Action would have short-term minor beneficial effects on the economies of the ROI and MSA. The Proposed Action has an estimated cost of $3 million, which would not provide any long-term economic gains to the surrounding area but would provide short-term employment opportunities (MSPARS 2005a). Under the Proposed Action, there would be no change in personnel at

Minneapolis-St. Paul IAP ARS. The Proposed Action would have no effect on personal income, poverty levels, or other demographic employment indicators in the Minneapolis-St. Paul MSA.

Environmental Justice. The populations of the ROI are not composed disproportionately of minority or low-income populations and would therefore not experience adverse impacts under the Proposed Action. The Proposed Action noise contours are only marginally larger then the baseline scenario (See **Figure 3-2**). Therefore, no adverse impacts are expected on low-income or minority residents in the ROI under the Proposed Action. The Proposed Action is bordered by a river, a highway, and a municipal airport, making possible effects on environmental justice from the Proposed Action unlikely.

3.9.5 No Action Alternative

No effects would be expected under the No Action Alternative as no change in baseline conditions would occur. Minneapolis-St. Paul IAP ARS would continue to operate with the current small arms range. Under the No Action Alternative, only 934 AW and 133 AW personnel would be able to use the facility and the small arms range would continue to operate at a reduced capacity.

3.10 Infrastructure

3.10.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure information contained in this chapter provides a brief overview of each infrastructure component and comments on its existing general condition.

Solid waste management primarily concerns itself with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and are limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance on landfills for disposal.

3.10.2 Existing Conditions

Transportation Systems. The small arms range is accessible via Post Road from SR 5. Parking at the range is approximately 70 feet northeast of the firing positions. The parking lot is paved and is adjoined to the classroom by a concrete sidewalk.

Energy Systems. There is no natural gas system or heating or cooling system at the small arms range. Electricity is the only energy source present. Electricity is supplied to the existing structures by a single power pole consisting of a three-phase transformer bank.

Water Supply Systems. There is no water supply system at the small arms range.

Sanitary Sewer/Wastewater Systems and Stormwater Systems. A restroom is attached to the classroom building; wastewater is conveyed to a waste holding tank.

Storm water discharges from 934 AW facilities are authorized under two distinct NPDES/State Disposal System permits issued by MPCA. Discharges from the small arms range property are permitted under

General Permit MN G610000, Authorization to Discharge Storm Water Associated with Industrial Activity. Area B is required to be covered under this permit because of the presence of the former small arms range landfill site. As specified in 40 CFR 122.126(b)(14), landfills that have received industrial waste are considered to meet the Federal definition of "engaging in industrial activity." MPCA considers this requirement to apply to active, inactive, or closed landfills. MPCA has assigned facility identification number A00001947 to Area B for its coverage under this general permit.

There are no point source discharges from USAF activities in Area B. Runoff is conveyed from the site as overland flow.

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

In accordance with the *Integrated Solid Waste Management Plan*, expended ammunition brass from the small arms range is collected at the range and sent to Building 803 to the Certified Munitions Inspector to ensure the munitions are explosives-free. When a significant amount is collected, the expended ammunition brass is sent to the Defense Reutilization and Marketing Office (DRMO)-Duluth for demilitarization and recycling. The 934 Environmental Flight (CEV) and DRMO-Duluth are responsible for ensuring that the spent brass (and any other nonhazardous munitions waste) is weighed and reported as recycled or disposed material on the nonhazardous solid waste diversion rate report (MSPARS 2005b).

Lead projectiles and lead dust from the small arms range are collected and handled by an off-base contractor and sent to a local smelter for recycling. Weights for this recycling are reported on the nonhazardous solid waste diversion rate report only if the lead waste does not meet the definition of a hazardous waste (MSPARS 2005b). There is one dumpster onsite.

3.10.3 Evaluation Criteria

Effects on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and additional needs for energy and water consumption, sanitary sewer systems, and transportation patterns and circulation. Impacts might arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes; and energy needs created by either direct or indirect workforce and population changes related to installation activities. An impact would be adverse if a proposed action exceeded capacity of a utility.

3.10.4 Environmental Consequences of the Proposed Action

Transportation Systems. No effects on the transportation systems would be expected. The small arms range would be closed during demolition and construction activities.

Energy Systems. No effects on electrical power would be expected. The Proposed Action would result in a modest increase in the use of the electrical power system due to the increase in personnel and additional infrastructure. However, this increase would be minor compared to total installation usage. The existing transformers would be removed and three new transformers would be installed. Electricity to each building would be installed in polyvinyl chloride conduit in a sand-encased duct bank (MSPARS 2006).

Beneficial effects would be expected from the Proposed Action. Infrared heaters would be installed above the firing positions, as well as in the restroom and control booth. Air conditioning systems are not planned for the firing positions, restroom, or control booth.

Water Supply Systems. No effects are expected on the water supply systems. The addition of potable water lines at the small arms range would have a minimal increase on the overall installation consumption. There are no additional USAF personnel associated with the Proposed Action. The use of the small arms range by 133 AW, Federal Air Marshals, Secret Service, and local police departments could slightly increase overall installation use, but would not cause a significant impact on the total public water supply.

Sanitary Sewer/Wastewater Systems and Stormwater Systems. Beneficial effects on the sanitary sewer/wastewater or storm water systems are expected. The septic system would be designed, installed, and inspected by a licensed Individual Sewage Treatment System designer and would be coordinated with the local environmental office and comply with local codes (MSPARS 2006). If the septic tank and field were constructed below the floodplain and if a flood were to occur, there is a possibility for the flood water to enter the septic tank and cause the sludge (from the bottom of the septic tank) to mix and be released to the flood water. Should this occur, it would not be expected that significant adverse effects on the environment or human health would occur because of the large volume of water diluting the sludge. The sludge would be spread over a large area by the flood water and would not be expected to create any hazard to downstream receptors (e.g., people). During construction it would be imperative that requirements of the industrial wastewater permit, Storm Water Pollution Prevention Plan, and BMPs are followed to minimize impacts. The Proposed Action would increase the amount of impervious surfaces; however, the Proposed Action includes the construction of two water retention ponds thereby alleviating the increase of storm water runoff.

Although the USAF primarily uses frangible nonleaded bullets for training, other users (i.e., 133 AW, Federal Air Marshals, Secret Service, and local police departments) would likely use other types of ammunition containing lead. Lead dust is generated as the bullets impact and is captured by the bullet trap. Lead dust and spent bullets captured would continue to be sent to a smelter for recycling. Since remnants of lead dust would remain, stormwater runoff from the small arms range would be diverted to a storm water retention area designed to slow runoff and allow the settlement of suspended lead particles to occur. The two retention ponds would have an aggregate bottom to capture and retain suspended lead. Storm water would exit the second retention pond through a 12-inch pipe discharging onto a riprap structure outside the small arms range. The discharge pipe would have a flap on the end to prevent potential flood water from entering the retention area. Flow from this point would be overland until the runoff has infiltrated. The topography and distance between the riprap structure and the Minnesota River is greater than 250 linear feet, which would reduce the potential of discharge to a water of the United States.

If flood waters were to crest over and enter the retention ponds, lead dust that has settled in the bottom could be carried off by flood waters. However, if this were to occur, it is not anticipated that there would be significant adverse effects expected on the environment or human health. Flood water would distribute the lead dust over a large area thereby making it unlikely that concentrations downstream in any one deposit would be at levels above the MPCA's remediation standard for residential use [300 milligrams per Kilogram (mg/Kg)], or industrial use (700 mg/Kg). Similarly, it is unlikely that concentrations would be above the USEPA preliminary remediation goal for direct contact of residential soil of 400 ppm or the industrial soil level of 800 ppm.

Solid Waste. Short-term minor adverse effects would be expected. Construction and demolition (C & D) waste generated from the Proposed Action would consist of building materials such as concrete, metals

(e.g., beams, conduit, piping, and wiring), and lumber. Contractors would be required to recycle C & D wastes to the greatest extent possible. Roughly 50,000 pounds, or about 25 tons, of solid waste would be generated from construction debris associated with the Proposed Action.

3.10.5 No Action Alternative

No impacts would be expected under the No Action Alternative as no change to baseline conditions would occur. The Proposed Action would not be implemented. Minneapolis-St. Paul IAP ARS would continue to use the current facilities, though routine replacement or renovation actions could occur through normal military maintenance and construction procedures, as circumstances might independently warrant. There would be no addition of potable water supply, storm water retention ponds, heating at the firing positions, or a septic system.

3.11 Hazardous Materials and Wastes

3.11.1 Definition of the Resource

Hazardous material is defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act, as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, or incapacitating reversible illness; or pose a substantial threat to human health or the environment. Hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment. In general, both hazardous materials and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

Evaluation of hazardous materials and wastes focuses on underground storage tanks (USTs) and aboveground storage tanks (ASTs) and the storage, transport, and use of pesticides and herbicides; fuels; and petroleum, oil, and lubricants (POL). Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well being of wildlife species, botanical habitats, soil systems, and water resources. In the event of a release of hazardous materials or wastes, the extent of contamination would vary based on the type of soil, topography, and water resources.

Special hazards are those substances that might pose a risk to human health but are not regulated as contaminants under the hazardous wastes statutes. Hazards associated with the Proposed Action are asbestos-containing material (ACM) and lead-based paint (LBP). The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards, describing their locations, quantities, and condition, assists in determining the significance of a proposed action.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, the DOD has dictated that all facilities develop and implement Hazardous Material Emergency Planning and Response Plans or Spill Prevention, Control, and Countermeasure Plans. Also, DOD has developed the Environmental Restoration Program (ERP) that is intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through ERP, DOD evaluates and cleans up sites

where hazardous wastes have been spilled or released to the environment. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in the identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed). These plans and programs, in addition to established legislation (i.e., CERCLA and RCRA), effectively form the "safety net" intended to protect the ecosystems on which most living organisms depend.

AFPD 32-70, *Environmental Quality*, establishes the policy that the USAF is committed to the following:

- Cleaning up environmental damage resulting from its past activities
- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Managing responsibly the irreplaceable natural and cultural resources it holds in public trust
- Eliminating pollution from its activities wherever possible.

AFPD 32-70 and the AFI 32-7000 series incorporate the requirements of all Federal regulations, other AFIs, and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.11.2 Existing Conditions

The 934 Civil Engineering Squadron CES/CEV is responsible for the hazardous material and waste plans for the installation. In conformance with the policies established by AFPD 32-70, *Environmental Quality*, the 934 CES/CEV has developed plans to manage hazardous materials, hazardous wastes, and special hazards on the base.

Hazardous Materials. Hazardous materials or POL used at the small arms range include cleaning agents and oil for gun cleaning and lubrication, and explosives found in the ammunition.

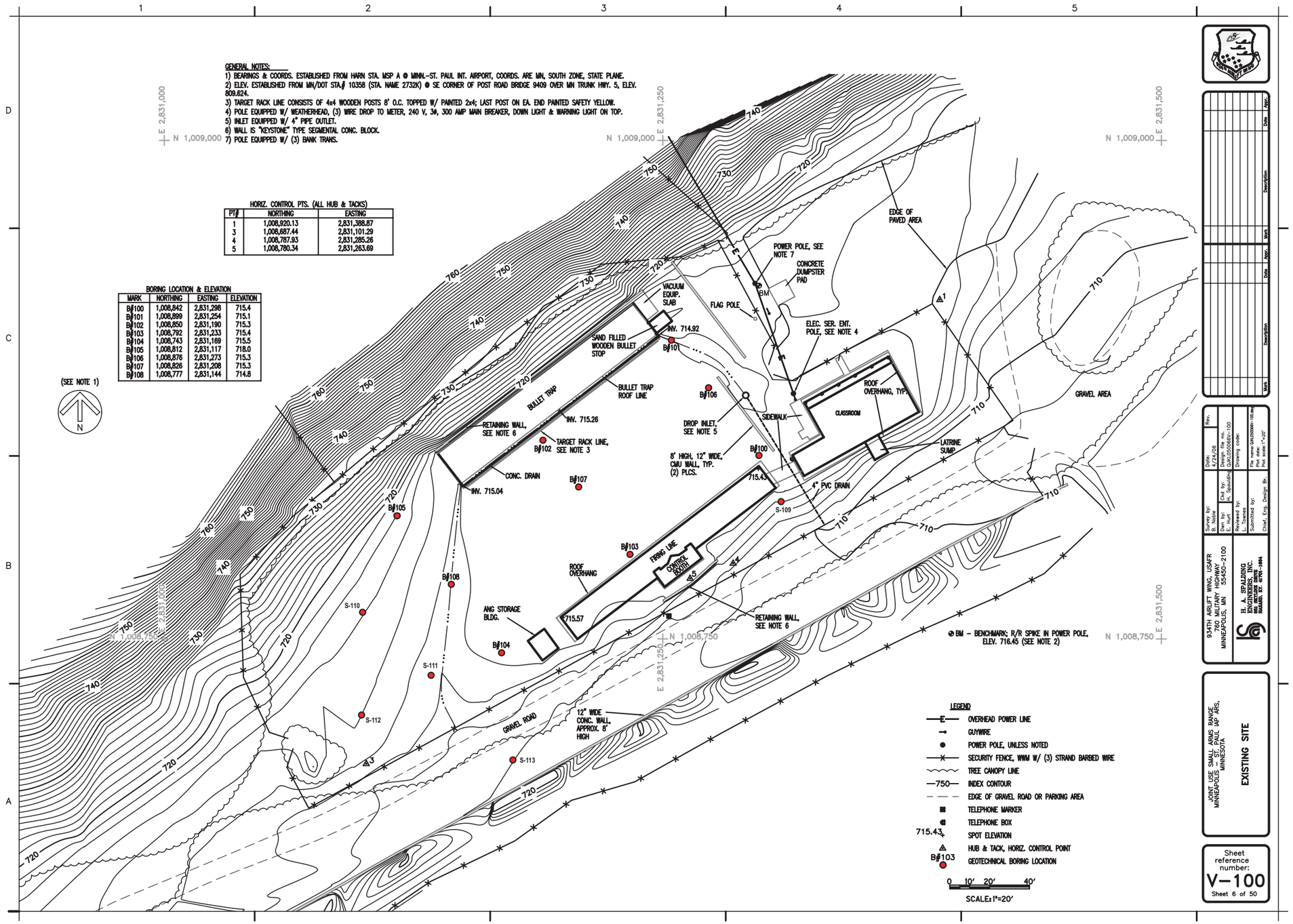
Hazardous Wastes. Soil sampling and analysis conducted during April, May, and September 2006 identified several locations with elevated lead levels. There were 33 soil samples taken which were screened for lead; several of the samples showed elevated lead levels. For comparison purposes, eight locations produced samples with total lead levels above the MPCA's remediation standard for residential use (300 mg/Kg), including four locations with results above the standard for industrial use (700 mg/Kg). Data on lead levels in the soil samples is presented in **Table 3-10**. **Figure 3.4** illustrates the sample locations.

The small arms range is regulated under EPA ID number MND985767128, and is categorized as a Very Small Quantity Generator (VSQG), which is defined by MPCA as a generator who generates 100 kilograms (220 pounds) or less per month of hazardous waste. According to the 2004 Hazardous Waste Management Plan (HWMP), the small arms range generates an annual average of 4,000 pounds of bullet fragments and lead dust, which are recycled and therefore not counted in determining generator categorization, and 15 pounds of swabs and patches from weapon cleaning, which are manifested for disposal as hazardous waste.

Storage Tanks. There are no storage tanks at the small arms range.

Table 3-10. Soil Sample Locations and Levels

Sample Location	Depth of sample	Total Lead (mg/kg)	Toxic Characteristic Leaching Procedure Lead (mg/L)
B#100	0.0 – 1.0 feet	512.0	
	2.0 – 3.5 feet	264.0	
	4.5 – 6.0 feet	3.1	
B#101	0.0 – 0.5 feet		35.50
	0.0 – 2.0 feet	1690.0	25.00
	2.0 – 3.5 feet	11.2	
	4.5 – 6.0 feet	2.3	
B#102	0.0 – 2.0 feet	454.0	
	2.0 – 3.5 feet	28.2	
	4.5 – 6.0 feet	4.8	
B#103	0.0 – 2.0 feet	224.0	
	2.0 – 3.5 feet	64.4	
	4.5 – 6.0 feet	2.6	
B#104	0.0 – 1.0 feet	268.0	
	2.0 – 3.5 feet	12.7	
	4.5 – 6.0 feet	7.0	
B#105	0.0 – 0.5 feet	92000.0	168.00
	0.0 – 1.5 feet	11500.0	94.00
	2.0 – 3.5 feet	71.1	
	4.5 – 6.0 feet	4.4	
B#106	4.5 – 6.0 feet	218.0	
	0.0 – 2.0 feet	2.0	
	4.5 – 6.0 feet	3.6	
B#107	0.0 – 1.0 feet	22.3	0.56
	2.0 – 3.5 feet	770.0	0.34
	4.5 – 6.0 feet	2.4	
B#108	0.0 – 2.0 feet	415.0	6.20
	2.0 – 3.5 feet	1250.0	8.40
	4.5 – 6.0 feet	2.4	
S-109	0.0 – 0.5 feet	698.0	3.20
S-110	0.0 – 0.5 feet	644.0	9.40
S-111	0.0 – 0.5 feet	184.0	7.80
S-112	0.0 – 0.5 feet	153.0	0.54
S-113	0.0 – 0.5 feet	59.7	0.42



Source: 834AW 2006

Figure 3.4. Soils Sample Locations

Environmental Restoration Program. ERP, formerly known as the Installation Restoration Program, is a subcomponent of the Defense Environmental Restoration Program that became law under SARA. The ERP requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites.

There are two ERP sites within the boundaries of Area B. The Small Arms Range Landfill (SARL) is a 2-acre closed/inactive landfill which has undergone remediation and is now considered to be in "long-term monitoring" status. SARL was formerly a "Superfund" site on the National Priorities List and Minnesota's Permanent List of Priorities. The site was deleted from the National Priorities List in December 1996 and from the Permanent List of Priorities in June 1998 (MSPARS 2005b). The second site was a temporary landfill for general refuse. The refuse was removed and disposed of in an approved landfill and is considered closed (934 AW 1996a). Neither of these sites is in the construction area of the Proposed Action.

Asbestos-Containing Material. According to the *Base General Plan for Minneapolis-St. Paul IAP ARS*, the building at the small arms range was constructed subsequent to ACM legislation and USAF regulations banning ACM use; therefore, it is assumed that the structure to be demolished does not contain ACM.

Lead-Based Paint. According to the General Plan, the building at the small arms range was constructed subsequent to LBP legislation and USAF regulations banning LBP use; therefore, it is assumed that the structure to be demolished does not contain LBP.

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act of 1990; EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*; EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*; and EO 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*. In accordance with EO 13101, the USAF preferentially chooses recycled-content products where possible. AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The 934 AW fulfills this requirement with the following plans:

- Storm Water Pollution Prevention Plan (2005)
- Hazardous Waste Management Plan (2004)
- Solid Waste Management Plan (2005)
- Spill Prevention, Control, and Countermeasure Plan.

These plans assist Minneapolis-St. Paul IAP ARS in maintaining a waste-reduction program and meeting the requirements of the CWA; the NPDES permit program; and Federal, state, and local requirements for spill prevention control and countermeasures. As stated previously, 4,000 pounds of lead were generated and recycled from the small arms range.

3.11.3 Evaluation Criteria

Effects on HAZMAT or hazardous waste management would be considered adverse if the Proposed Action resulted in noncompliance with applicable Federal and state regulations, or increased the amounts generated or procured beyond current Minneapolis-St. Paul IAP ARS waste management procedures and capacities. Effects on the ERP would be considered adverse if the Proposed Action disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment or if they resulted in

the disturbance or creation of contaminated sites. Effects on fuels management would be adverse if the established management policies, procedures, and handling capacities could not accommodate the activities associated with the Proposed Action.

3.11.4 Environmental Consequences of the Proposed Action

Hazardous Materials. No adverse effects on hazardous materials management would be expected. Products containing hazardous materials would be procured and used during the proposed construction projects. It is anticipated that the quantity of products containing hazardous materials used during the construction activities would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal and state regulations. Contractors must report use of hazardous materials to the Hazardous Materials Pharmacy (HAZMART) including pertinent information (e.g., Material Safety Data Sheets). Following construction there would be no new chemicals or toxic substances used or stored at the small arms range.

Hazardous Waste. Beneficial effects on hazardous waste management would be expected. Two storm water retention ponds would be constructed and designed to capture any lead particles suspended in runoff.

It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be minimial. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, as well as the installation's HWMP. This increase would not be expected to impact the management plans or capacities for handling this waste. If available, wastes should be recycled to the greatest extent possible.

Once operational, the small arms range would generate more lead for recycling because the annual number of rounds fired would increase by 25 percent. Also, bullet fragment recovery would be higher because of the improvements in walls and floors that deflect bullets into the bullet trap. Hazardous wastes, such as used gun cleaning patches, would increase. However, the additional generation of lead fragments and lead dust is not considered hazardous waste because it is recycled.

It is not anticipated that there would be adverse effects to the environment or human health if bullet fragments were suspended during a flood event. Flood water would distribute the lead dust over a large area thereby making it unlikely that deposits downstream would be concentrated at levels above the MPCA's or USEPA criteria. As such, it would not constitute the potential to be a hazardous waste.

In May 2006, the 934 AW initiated discussions with MPCA regarding regulatory requirements and clean up planning. MPCA has provided guidance addressing regulatory requirements and provisions applicable if lead contaminated soils are moved during construction. Soil treatment and management would be accomplished in accordance with a clean up plan reviewed and approved by MPCA. Lead-contaminated soil would be removed from the area of construction, with subsequent off-site disposal in accordance with MPCA's regulatory requirements. OSHA's Lead in Construction Standard would apply to soil removal operations and procedures for compliance with this Standard would be included in the clean up plan submitted to MPCA for review and approval.

ERP. No effects on the ERP would be expected. There are no ERP sites within the area to be disturbed by the Proposed Action. BMPs would be followed to ensure that contamination from a spill does not occur.

Pollution Prevention. No effects on the pollution prevention program at the small arms range would be expected. Quantities of hazardous material purchases, off-installation transport of hazardous waste, disposal of MSW, and energy consumption would continue. Operation of the new facilities would require procurement of products containing hazardous materials, generation of hazardous waste, and consumption of energy consistent with the baseline condition associated with the operation of the proposed facilities. The installation's Pollution Prevention Plan, Spill Prevention Control and Countermeasure Plan, and HAZMAT/HWMP, would remain in place and BMPs would be followed to ensure compliance. Contractors should be required to recycle C & D wastes to the greatest extent possible. Recycling of bullet fragments and lead dust would continue. BMPs, erosion and sediment controls, and storm water management practices would be used to minimize turbidity in water.

3.11.5 No Action Alternative

No effects would be expected under the No Action Alternative as there would be no change in baseline conditions. Hazardous waste generation would remain unchanged and management and disposal of HAZMAT and wastes would continue according to procedures already in place. Lead contamination found in the soils would remain.

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4. Cumulative and Other Impacts

4.1 Cumulative Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the project area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

An effort was undertaken to identify other projects for evaluation in the context of the cumulative impact analysis. This was further developed through review of public documents, information gained from the IICEP process, and other coordination with various applicable agencies. The Proposed Action is estimated to take 2 years, therefore recent past projects and projects proposed through 2010 were considered in the analysis.

For the cumulative impact analysis, the ROI for geological, water, and biological resources includes the Minnesota River, Fort Snelling State Park, and the Minnesota Valley National Wildlife Refuge. The ROI for land use, cultural resources, socioeconomics, infrastructure, and hazardous materials includes the natural resource areas (Minnesota River, Fort Snelling State Park, and the Minnesota Valley National Wildlife Refuge) in addition to Minneapolis-St. Paul IAP and the land immediately surrounding it. The ROI for air quality is Hennepin County.

Proposed projects that will occur at Minneapolis-St. Paul IAP through 2010 include the following:

- Partial removal of the aircraft maintenance buildings and the subsequent construction of the Terminal H expansion
- Humphrey Terminal expansion which will include 16 gates for non-Sky Team airlines that fly into Minneapolis-St. Paul IAP
- Minor exterior and interior renovations at the Lindberg Terminal, including adding a second passenger drop-off and redeveloping passenger check-in and security.

Proposed projects outside of Minneapolis-St. Paul IAP property and adjacent to the Proposed Action include the following.

Minnesota Valley National Wildlife Refuge, Installation of Water-Control Structure. Under the proposed project a new structure will provide drainage from Long Meadow Lake in the Minnesota Valley National Wildlife Refuge. The new structure would allow the water level in the lake to decrease in order to simulate natural drought conditions and enhance existing wetlands through improvements to aquatic vegetation.

Fort Snelling State Park, Trail Construction. Under the proposed project three trails would be constructed at Fort Snelling State Park from 2006–2008. Approximately 300 yards of the Dakota County Trail will be replaced and an old trail section eliminated. A new route for a trail on Pike Island will be constructed since the existing trail is being undercut by the river. In addition, a 7-mile trail will be constructed across the Minnesota Valley National Wildlife Refuge, connecting to 4 miles of existing trail at Fort Snelling State Park. The proposed trail would cross Area B by utilizing the service road bordering the small arms range to the southeast. Construction impacts for the creation of the trail are expected to be

resource area of concern would be safety. Safety issues might need to be addressed regarding hikers and bikers utilizing the trail during range operating activities

The adjacent projects would result in minor, adverse impacts on soils, vegetation, wildlife, water quality, materials, and energy resources. With the exception of the proposed hiking and biking trail through Area B, no projects in the ROI were identified that would have any potential for an additive impact in conjunction with the Proposed Action. No significant cumulative impacts on the environment are anticipated from the Proposed Action in conjunction with the above projects.

4.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Geological Resources. Developments under the Proposed Action would produce minor soil disturbance as a result of construction activities such as grading, excavating, and trenching of the ground. Implementation of BMPs during construction would limit environmental impacts from the construction activities. Standard erosion-control means would also reduce environmental impacts related to these characteristics. Although unavoidable, the cumulative impacts on soils are not considered significant.

Biological Resources. It is not anticipated that the Proposed Action would result in any loss to wildlife habitat since the proposed small arms range would be a minimal expansion of the existing range. The adjacent projects at the Minnesota Valley National Wildlife Refuge and Fort Snelling State Park would likely impact wildlife habitat temporarily during the construction phases. Minor impacts on wetlands could occur as a result of potential runoff from the project sites. Implementation of BMPs would minimize the potential for adverse effects associated with runoff.

Infrastructure. Roughly 50,000 pounds, or about 25 tons, of solid waste would be generated from construction debris of the Proposed Action. This is an unavoidable adverse impact. However, this impact is not considered significant since local landfill capacity would not be exceeded by the additional solid waste generated by the Proposed Action.

Energy Resources. The use of nonrenewable resources in construction activities is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy resources, although relatively small, would be committed to the Proposed Action.

Floodplain. The Proposed Action would have long-term minor to moderate adverse effects associated with the 100-year floodplain which would include floodplain volume, area, and flow characteristics. Properly designed erosion and sediment controls and storm water management practices would be implemented during demolition and construction to minimize potential adverse impacts. Construction within the 100-year floodplain under the Proposed Action would be designed and implemented consistent with the provisions of EO 11988, *Floodplain Management*, including such actions as elevation of structures above the flood level, designing structures to reduce the affected surface volume displaced, and incorporating flood-proofing and flood protection measures.

4.3 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

As discussed in **Section 3.6**, the small arms range is within the boundaries of MNRRA and in the jurisdiction of Hennepin County. Consequently, Minneapolis-St. Paul IAP ARS is required to abide by Hennepin County's Critical Area Plan. Currently Hennepin County does not have a Critical Area Plan. However, the proposed small arms range would implement the restrictions outlined in the Minneapolis Critical Area Plan that was approved on 16 June 2006. This includes building height restrictions, the preservation of the riverbank, BMPs for stormwater management, and the use of natural screening to limit the site of the structure from the opposing bank and river surface.

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Minneapolis-St. Paul IAP ARS. The proposed construction activities would not result in any significant or incompatible land use changes on or off of the installation. The Proposed Action has been sited according to existing land use zones. Consequently, construction activities would not be in conflict with installation land use policies or objectives. The Proposed Action would not conflict with any applicable off-installation land use ordinances.

4.4 Relationship Between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of the environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Several kinds of activities could result in short-term resource use that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in an intensification of land use at Minneapolis-St. Paul IAP ARS or in the surrounding area. None of the proposed projects discussed in this section would result in a significant loss of open space.

4.5 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals). Irretrievable commitments are those like land, which cannot be altered back into their natural state once disturbed.

The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, and human resources. The loss of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action include building materials (for construction of facilities), concrete, and various material supplies (for infrastructure). Most of the

materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. Electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Land. During construction, it is estimated that 0.75 acres of land would be graded under the Proposed Action. However, the proposed small arms range would be approximately 0.44 acres. The remaining portion of land would consist mainly of retention ponds, gravel, and vegetation. Since the existing small arms range is approximately 0.37 acres, about 0.07 acres of land would be irretrievably lost once the Proposed Action was complete.

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

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APPENDIX A

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A

Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws and Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (Air Force Instruction [AFI] 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near U.S. Air Force (USAF) installations.

Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

Air Quality

The Clean Air Act (CAA) of 1970 and Amendments of 1977 and 1990 recognize that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to use financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCR). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

Safety

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program,* implements AFPD 91-3, *Occupational Safety and Health,* by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a water body can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Critical Areas Act (Minn. Stat. § 116G.01) was approved in 1973 by the Minnesota legislature in order to protect areas that have historical, cultural, or aesthetic values, or natural systems that perform functions of greater than local significance. The Critical Area Act requires that municipalities in Critical Areas devise a plan for how it will meet the goals of the Act. New developments in a Critical Area should meet with the requirements of the Critical Area Plan. Local governments, the Metropolitan Council, the Minnesota Department of Natural Resources, and the National Park Service work in partnership to ensure that Critical Areas are maintained in accordance with the Act.

Congress established the Mississippi National River and Recreation Area (MNRRA) in 1988. The goal is to protect and preserve an area that is central to the ecology, culture, politics, and history of the United States. MNRAA, at approximately 54,000 acres, encompasses the same area as the Mississippi River Critical Area, and stretches along 72 miles of the river.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintain the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by

calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural

rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality

of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agency wide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes, redesigning products, substituting raw materials, and making improvements in management techniques, training, and inventory control. EO 12856, *Federal Compliance with Right-to Know Laws and Pollution Prevention Requirements* (August 3, 1993), requires Federal agencies to comply with the provisions of the PPA and requires Federal agencies to ensure all necessary actions are taken to prevent pollution. In addition, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to "incorporate pollution prevention principles, techniques, and mechanisms into their planning and decision making processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA."

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for "cradle-to-grave" management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the

Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with "hazardous substances" or "extremely hazardous substances" to prepare comprehensive emergency plans and to report accidental releases. EO 12856 requires Federal agencies to comply with the provisions of EPCRA. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as "owners." However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the "innocent purchaser" defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs Federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

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APPENDIX B

AGENCY AND PUBLIC INVOLVEMENT

DEPARTMENT OF THE AIR FORCE

AIR FORCE RESERVE COMMAND

16 June 2006

MEMORANDUM FOR SEE DISTRIBUTION

FROM: 934 MSG/CE
760 Military Highway
Minneapolis, MN 55450-2100

SUBJECT: Solicitation of Input into the Preparation of an Environmental Assessment (EA) addressing the Reconstruction of the Joint Use Small Arms Range for the 934th Airlift Wing, Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota

1. The U.S. Air Force is preparing an EA to address the Reconstruction of the Joint Use Small Arms Range for the 934th Airlift Wing located at Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota. Under the Proposed Action, an existing small arms range would be demolished and a new, partially contained joint use small arms range would be constructed.

2. The environmental impact analysis process for the Proposed Action and appropriate alternatives is being conducted by the 934th Airlift Wing in accordance with the Council on Environmental Quality guidelines pursuant to the requirements of the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we invite your participation by reviewing the attached DOPAA and solicit your comments concerning the proposal and any potential environmental issues of concern to you.

3. If members of your staff have any technical-related questions, please contact Douglas Yocum at (612) 713-1955. Please submit comments, not later than 30 days from the date of this letter, directly to Mr. Yocum at 934 MSG/CEV, 760 Military Highway, Minneapolis, MN 55450-2100.

LESLIE W. CANARR
Base Civil Engineer

Attachments:
1. Description of the Proposed Action and Alternatives
2. Distribution List

cc:
HQ AFRC/A7CVX (Ms. Williford)
AFCEE/ISA (Mr. Smith)

Environmental Assessment of Construction of the Joint Use Small Arms Range of the 934 AW at Minneapolis-St. Paul IAP ARS, Minnesota

Interagency and Intergovernmental Coordination for Environmental Planning List

Federal

The Honorable Mark Dayton
U.S. Senator
Federal Building, Suite 298
Fort Snelling, MN 55111

The Honorable Norm Coleman
U.S. Senator
2550 University Ave W, Suite 100N
St. Paul, MN 55114

The Honorable Martin Olav Sabo
U.S. Congressmen
250 Marquette Ave., Ste. 225
Minneapolis, MN 55401

U.S. Environmental Protection Agency
Environmental Planning and Evaluation Unit
77 W. Jackson Blvd., Mailstop B-19J
Chicago, IL 60604-3590

U.S. Fish and Wildlife Service
Twin Cities Field Office E.S.
4101 E. 80th St.
Bloomington, MN 55425-1665

U.S. Army Corp of Engineers
Regulatory Functions Branch
Army Corps of Engineers Center
190 Fifth St. E.
St. Paul, MN 55101-1638

State

Environmental Quality Board
Environmental Review Program
300 Centennial Office Building
658 Cedar Street
St. Paul, MN 55155

Minnesota Department of Natural Resources
Environmental Review Unit
500 Lafayette Road
St. Paul, MN 55155-4010

Minnesota Pollution Control Agency
Env. Review Unit/Majors/Rem Division
520 Lafayette Road
St. Paul, MN 55155-4194

Minnesota Historical Society
State Historic Preservation Office
345 Kellogg Blvd. West, Level A
St. Paul, MN 55102

Department of Transportation
MN/DOT Environmental Services
395 John Ireland Blvd, MS620
St. Paul, MN 55155

Local

Lower Minnesota River Watershed District
200 4th Avenue West
Shakopee, MN 55379

Metropolitan Council
Referrals Coordinator
Planning & Technical Assistance Unit
230 E. Fifth Street
St. Paul, MN 55101

Hennepin County
Planning Department, Suite A-2308
300 South 6th Street
Minneapolis, MN 55487

City of Minneapolis
Planning Department
350 South 5th Street
Minneapolis, MN 55415

Metropolitan Airports Commission
Attn: Bridget Rief, Airside Project Manager
Lindbergh Terminal, Room 325
Minneapolis-St. Paul International Airport
St. Paul, MN

Minnesota Valley National Wildlife Refuge
3815 American Blvd. East
Bloomington, MN 55425

Fort Snelling State Park
101 Snelling Lake Road
St. Paul Minnesota 55111

Ms. JoAnn M. Kyral
Mississippi National River &
Recreation Area
111 Kellogg Blvd. East
St. Paul, MN 55101-1256

Tribal

Lower Sioux Community
Attn: Tribal Chair
Box 308
Morton, MN 56270

Upper Sioux Community
Attn: Tribal Chair
P. O. Box 147
Granite Falls, MN 56241

Mendota Mdewakanton Dakota Community
Attn: Tribal Chair
P.O. Box 50835, 1351 Sibley Memorial Hwy,
Mendota, MN 55150

Shakopee Mdewakanton Sioux Community
Attn: Tribal Chair
2330 Sioux Trail NW
Prior Lake, MN 55372

Prairie Island Mdewakanton Community
Attn: President Doreen Hagen
5636 Sturgeon Lake Rd.
Welch, MN 55089

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 0 4 2006

REPLY TO THE ATTENTION OF:

B-19J

Douglas Yocum
934 MSG/CEV
760 Military Highway
Minneapolis, Minnesota 55450-2100

Re: Draft Environmental Assessment and Finding of No Significant Impact for the Construction of the Joint Use Small Arms Range for the 934th Airlift Wing at the Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota

Dear Mr. Yocum:

The U.S. Environmental Protection Agency (U.S. EPA) has reviewed the August, 2006 draft versions of the environment assessment and finding of no significant impact (DEA and draft FONSI) for the joint use small arms range for the 934th Airlift Wing at the Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota. According to the DEA, the proposed action would demolish the existing small arms range and construct a new, partially contained range. We offer the following comments for the DEA and draft FONSI, in accordance with our responsibilities under the National Environmental Policy Act (NEPA):

The DEA does not provide a comprehensive description of existing lead contamination from operations at the firing range. The DEA states, "Soil sampling and analysis conducted during April and May 2006 identified several locations with elevated lead levels…six locations produced samples with total lead levels above the Minnesota Pollution Control Agency's remediation standard for residential use (300 mg/Kg), including four locations with results above the standard for industrial use (700 mg/Kg)." However, the DEA does not include data of lead levels in the soil, nor does the DEA indicate the location and range of lead contamination. The final environmental assessment (FEA) should provide data of lead levels in the soil, and it should include a map showing the extent of existing lead contamination, in order to give a clear picture of existing conditions. Finally, the FEA and final FONSI should include remediation plans for existing lead contamination.

We are concerned about erosion and sedimentation impacts from construction activities. The DEA states that construction activities (e.g. grading, excavation, placement of fill, compaction, mixing, or augmentation necessary to prepare the site for redevelopment) may cause erosion-related impacts "…if properly designed erosion and sedimentation controls and storm water management were not implemented during site development." The DEA and draft FONSI don't include commitments to use best management practices to control erosion and sedimentation.

The FEA and final FONSI should describe the practices to be used and document these commitments.

The DEA and draft FONSI do not include a monitoring and mitigation plan for airborne lead emissions. The DEA states that the construction project will generate fugitive dust from ground-disturbing activities. Lead particles could be released to the air as a result of these activities. The DEA and draft FONSI don't include a commitment to use dust-suppression methods during construction. The FEA and final FONSI should include this commitment. We recommend the project proponents monitor the ambient air for lead during ground-disturbing activities. This could help protect community and worker health. The lead concentration at the project fenceline should not exceed the National Ambient Air Quality Standard of 1.5 micrograms per cubic meter (on average, on a quarterly basis). The project proponents should consult with the Minnesota Pollution Control Agency and the Minnesota Department of Labor and Industry on this issue. Subsequently, any lead monitoring plan should be documented in the FEA and final FONSI.

Finally, we have concerns about whether the new range facility would attract wildlife. Specifically, we are concerned about the possibility of waterfowl being poisoned by ingesting lead at the facility. The FEA should evaluate this issue. If the proposed project would cause significant lead poisoning impacts for waterfowl, then the FEA and final FONSI should include appropriate mitigation measures.

Thank you for the opportunity to review and provide comments on the DEA. We would expect to concur with the final FONSI once our issues are satisfactorily addressed. For your information, our Agency provides information on best management practices for lead at outdoor shooting ranges at http://www.epa.gov/region2/waste/leadshot. If you have any questions or comments, please feel free to contact Newton Ellens, of my staff, at (312) 353-5562.

Sincerely yours,

Kenneth A. Westlake
Chief, NEPA Implementation Section
Office of Science, Ecosystems, and Communities

cc: Beth Gawrys
Minnesota Pollution Control Agency

Nick Rowse
U.S. Fish and Wildlife Service
Twin Cities Ecological Services Field Office

Bob Welch
North Metro Office
Minnesota Department of Natural Resources

Jeff Isakson
Director, Occupational Safety and Health
Minnesota Department of Labor and Industry

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
77 West Jackson Boulevard
Chicago, IL 60604

July 5, 2006

Douglas Yocum
U.S. Air Force Reserve
934 MSG/CEV
760 Military Highway
Minneapolis, Minnesota 55450-2100

Regarding: Description of Proposed Action and Alternatives for the Reconstruction of the Joint Small Arms Range for the 934th Airlift Wing, Minneapolis-St. Paul International Airport Air Reserve Station, Minneapolis, Minnesota

Dear Mr. Yocum:

The Environmental Planning and Evaluation Branch has received the document listed above. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clean Air Act; U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA if interest and resources permit.

We did not undertake a detailed review of the document you sent to this office, and will not be generating comments because of the reason selected below.

_____The document was not prepared under NEPA.

_____The document was given a cursory review, but other workload priorities precluded us from detailed review and comment.

_____The document was given a cursory review, and we determined that there were no significant concerns meriting comment.

X_____We opted to wait for the next level of documentation on this project before deciding whether or not to comment.

We reserve the right to reconsider undertaking a review at future planning stages, or if significant new data on the project is made available by the sponsoring agency or other interested parties. Thank you for providing information on the project.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Science, Ecosystems, and Communities

July 10, 2006

Mr. Douglas Yocum
934 MSG/CEV
760 Military Highway
Minneapolis, MN 55450-2100

RE: *Metropolitan Council Review of Environmental Assessment (EA) for the* ***U.S.A.F. Joint-use Small Arms Range*** *located at the Minneapolis-St. Paul International Airport Air Force Reserve Station, MN;* Metropolitan Council Review File No. 19775-1

Dear Mr. Yocum:

On June 20, 2006 the Metropolitan Council received a copy of the Environmental Assessment (EA) for the U.S.A.F. Joint-use Small Arms Range located at the Minneapolis-St. Paul International Airport Air Force Reserve Station, MN. The proposed project is to demolish an existing joint use small arms firing range and reconstruct a partially contained facility on a small site between MN Highway 5 and the Minnesota River. The proposed facility is located on a site that is within Fort Snelling State Park, within the Critical Area of the Minnesota River, and adjacent to the Minnesota Valley State Trail.

Council staff reviewed this EA to determine its potential for: *a) significant environmental impact; b) its adequacy and accuracy in addressing regional concerns, and; c) its impact on Council property, activities and/or facilities.* Review by Metropolitan Council staff finds that the EA document as presented raises no major issues of consistency with Council policies. However, staff offers the following comment for your consideration.

- **EA document, pages A-2 and A-3, Water Resources, the Wild and Scenic Rivers Act of 1968.** *This section should include the Critical Areas Act, State Executive Order 79-19.* The Mississippi River Critical Area Program is a joint local and state program that implements the Critical Areas Act passed by the Minnesota legislature in 1973. The Critical Area Act requires that each government having jurisdiction over land within the Critical Area boundaries prepare a plan to meet the goals and purposes of the Act. The Minnesota Department of Natural Resources has final review authority over projects within the designated critical areas of Minnesota rivers.

This will conclude the Council's review the EA. Please note that we will take no formal action on the EA. If you have any questions or need further information, please contact Denise Pedersen Engen, principal reviewer for this project, at 651-602-1513.

Sincerely,

Phyllis Hanson

Phyllis Hanson, Manager
Local Planning Assistance

cc: Russ Susag, Metropolitan Council District 5
Denise Pedersen Engen, Sector Representative and Principal Reviewer
Cheryl Olsen, Reviews Coordinator

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

IN REPLY REFER TO:
FWS/AFWE/TCFO

TAKE PRIDE IN AMERICA

JUL 13 2006

Mr. Douglas Yocum
934 MSG/CEV
Department of the Air Force
Air Force Reserve Command
760 Military Highway
Minneapolis, Minnesota 55450-2100

Dear Mr. Yocum:

This responds to your June 16, 2006, memorandum soliciting input into the preparation of an Environmental Assessment addressing the reconstruction of the Joint Use Small Arms Range for the 934th Airlift Wing, Minneapolis-St. Paul International Airport Air Reserve Station, Minnesota. The proposed action would include the demolition of the existing small arms range and the construction of a new, partially contained range. The shooting area would be designed and constructed as a single enclosure, dived into two separate section, totaling 28 expanded firing positions.

There are no records of bald eagle nest sites or other federally listed species in the general vicinity near the above project area. Under the regulations implementing section 7 of the Endangered Species Act, Federal agencies must review their actions and consult with the Fish and Wildlife Service (Service) if they determine that their actions "may affect" listed resources (50 CFR 402.14).

We appreciate the opportunity to comment and look forward to working with you in the future. Please call Nick Rowse of my staff at (612) 725-3548, extension 210, or by email at *nick_rowse@fws.gov* if you have questions regarding our comments,.

Sincerely,

Michael Olson
Acting Field Supervisor

MINNESOTA HISTORICAL SOCIETY
STATE HISTORIC PRESERVATION OFFICE

July 28, 2006

Mr. Douglas Yocum
934 MSG/CEV
760 Military Highway
Minneapolis, MN 55450-2100

RE: Reconstruction of the Joint Use Small Arms Range for the 934th Airlift Wing
Minneapolis-St. Paul International Airport Air Reserve Station
Hennepin County
SHPO Number: 2006-2483

Dear Mr. Yocum:

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36CFR800).

Based on available information, we conclude that **no properties** listed on or eligible for listing on the National Register of Historic Places will be affected by this project

Please contact our Compliance Section at (651) 296-5462 if you have any questions regarding our review of this project.

Sincerely,

Britta L. Bloomberg
Deputy State Historic Preservation Officer

APPENDIX C

AIR QUALITY EMISSIONS CALCULATIONS SPREADSHEETS

Summary Summarizes total emissions by calendar year.
Page C-1

Combustion Estimates emissions from non-road equipment exhaust as well as painting.
Pages C-2, C-3, C-4, and C-5

Fugitive Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Pages C-6, C-7, and C-8

Grading Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
Page C-9

AQCR Tier Report Summarizes total emissions for the Minneapolis-St. Paul Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.
Page C-10

CY2007

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
Construction Combustion	0.227	0.124	0.264	0.007	0.008
Construction Fugitive Dust					1.068
TOTAL CY2007	0.227	0.124	0.264	0.007	1.075

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Minneapolis-St. Paul Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2001	153,971	163,699	1,029,245	56,974	88,080

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 07/11/06.

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	153,971	163,699	1,029,245	56,974	88,080
2007 Emissions	0.227	0.124	0.264	0.007	1.075
Proposed Action %	**0.0001%**	**0.00008%**	**0.00003%**	**0.00001%**	**0.0012%**

Construction Combustion Emissions for CY 2007

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

1	Construction Activities	12,372	ft^2	0.284	acres	(includes 12,002 ft^2 conc. Pad, 306 ft^2 restroom facility, and 64 ft^2 control booth)
2	Demolition Activities	10,000	ft^2	0.230	acres	(includes demolition of existing enclosure and bullet trap)
3	Paving Operations	4,800	ft^2	0.110	acres	(includes 200 ft by 24 ft of road to be reconstructed)
4	Installation of Utilities	4,660	ft^2	0.107	acres	(includes 2,000 ft by 2 ft wide utility trench, 80 ft by 3 ft drain, and 210 ft by 2 ft fence)
5	Site Grading	32,670	ft^2	0.750	acres	(includes 0.75 ac construction site disturbance)

Total Building Construction Area:	12,372	ft^2	(1)
Total Demolished Area:	10,000	ft^2	(2)
Total Paved Area:	4,800	ft^2	(3)
Total Disturbed Area:	37,330	ft^2	(4 and 5)
Construction Duration:	1.0	year(s)	
Annual Construction Activity:	230	days/yr	(Project will last for 1 year (230 working days))

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	1	5.186	0.773	6.058	0.104	0.174
Paving Equipment	1	0.143	0.025	0.209	0.003	0.004
Demolition Equipment	1	0.660	0.114	0.967	0.013	0.018
Building Construction	1	1.907	0.283	2.216	0.057	0.064
Air Compressor for Architectural Coating	1	0.194	0.024	0.165	0.004	0.008
Architectural Coating**			9.065			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	37,330	0.86	1	(from "CY2007 Grading" worksheet)
Paving:	4,800	0.11	1	
Demolition:	10,000	0.23	9	
Building Construction:	12,372	0.28	230	
Architectural Coating	12,372	0.28	20	(per the SMAQMD "Air Quality of Thresholds of Significance", 1994 version)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	5.19	0.77	6.06	0.10	0.17
Paving	0.14	0.02	0.21	0.00	0.00
Demolition	5.94	1.02	8.71	0.12	0.17
Building Construction	438.72	65.19	509.73	13.19	14.83
Architectural Coatings	3.88	181.79	3.31	0.08	0.15
Total Emissions (lbs):	**453.87**	**248.80**	**528.01**	**13.50**	**15.33**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	453.87	248.80	528.01	13.50	15.33
Total Project Emissions (tons)	0.23	0.12	0.26	0.01	0.01

Construction Fugitive Dust Emissions for CY 2007

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	0.86	acres/yr	(From "CY2007 Combustion" worksheet)
Grading days/yr:	0.16	days/yr	(From "CY2007 Grading worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	50	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	110	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1, Ave. range from 40-240 days/yr on U.S. coastline)	
Wind speed > 12 mph %, I:	34	%	Average annual windspeed (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/minnesota/minneapolis/)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	3.00	vehicles	(From "CY2007 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	1.5	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	15	VMT/day	
Construction VMT per acre	2.8	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM_{10})

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a} (W/3)^{b})]$ [(365-P)/365]	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.08 lbs/hr	1.5 hr/acre	0.10 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.46 lbs/VMT	2.8 VMT/acre	6.90 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 12 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 1.2 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.10 lbs/acre	0.86	NA	0	0.000
Grading	0.80 lbs/acre	0.86	NA	1	0.000
Vehicle Traffic	6.90 lbs/acre	0.86	NA	6	0.003
Erosion of Soil Piles	1.20 lbs/acre/day	0.86	90	93	0.046
Erosion of Graded Surface	26.40 lbs/acre/day	0.86	90	2,036	1.018
TOTAL				2,135	1.07

Soil Disturbance EF: 7.80 lbs/acre
Wind Erosion EF: 27.6 lbs/acre/day

Back calculate to get EF: 15,707.51 lbs/acre/grading day

Construction (Grading) Schedule for CY 2007

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 0.28 acres/yr (from "CY2007 Combustion" Worksheet)
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	0.28	0.04
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	0.28	0.14
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.14	0.14
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.14	0.06
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	0.28	0.10
TOTAL								0.48

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 0.48
Qty Equipment: 3.00
Grading days/yr: 0.16

Minneapolis-St. Paul Intrastate Air Quality Control Region

			Area Source Emissions						Point Source Emissions					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
SORT														
1	MN	Anoka Co	102,746	11,052	10,744	2,480	722	14,211	48.4	76.1	42.2	32.1	20	586
2	MN	Carver Co	25,514	2,695	9,890	1,934	183	3,706	281	421	119	92.3	236	204
3	MN	Dakota Co	123,205	12,553	13,118	3,073	822	18,805	1,188	9,788	1,245	987	6,480	2,601
4	MN	Hennepin Co	464,803	47,454	20,257	6,711	3,251	68,561	1,035	15,550	1,740	1,199	13,601	3,394
5	MN	Ramsey Co	205,102	20,709	4,471	2,278	1,500	31,532	1,805	6,598	1,552	825	4,625	3,041
6	MN	Scott Co	28,881	3,127	9,419	1,939	208	4,430	90.1	1,184	460	330	531	387
7	MN	Washington Co	71,707	9,890	14,195	2,945	875	9,135	2,839	12,874	828	680	23,920	3,106
Grand Total			1,021,958	107,480	82,094	21,360	7,561	150,380	7,287	46,491	5,986	4,145	49,413	13,319

SOURCE:
USEPA - AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html)
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on July 11, 2006

Geographic Area: Anoka Co, Carver Co, Dakota Co, Hennepin Co, Ramsey Co, Scott Co, and Washington Co
Pollutants: Carbon Monoxide, Nitrogen Oxides, Particulate (size < 10 micrometers), Particulate (size < 2.5 micrometers), Sulfur Dioxide, Volatile Organic Compounds
Year: 2001
Emissions In Tons Per Year