Final Environmental Assessment

Establishment of an Off-Highway Vehicle (OHV) Program at Arnold Air Force Base, Tennessee

Prepared for

Arnold Air Force Base

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Final Finding of No Significant Impact

Arnold Air Force Base, Tennessee
Establishment of an Off-Highway Vehicle (OHV) Program

Arnold Air Force Base (AFB) has prepared an environmental assessment (EA) that evaluates the potential environmental impacts associated with establishing an off-highway vehicle (OHV) program. Within the context of this document, OHV refers to four-wheel all-terrain vehicles (ATVs) (including side-by-sides) and off-highway motorcycles (motocross, or dirt bikes). The EA is incorporated by reference within this Finding of No Significant Impact (FONSI); specific details regarding the Proposed Action, alternatives, and analysis can be found in the appropriate sections of the EA as referenced in the FONSI.

Description of the Proposed Action (OHV Trail System and Motocross Area) – Section 2.1 of the EA

The Proposed Action is for Arnold AFB to establish an OHV program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) consisting of berms and jumps set aside for off-highway motorcycle (motocross) riding. An approximately 10,000-square-foot gravel parking and loading/unloading area for the users would also be developed.

Alternative 1: Motocross Area Only – Section 2.2 of the EA

Alternative 1 would consist of the motocross area only; development, operation, and maintenance of the motocross area would occur as described under the Proposed Action.

No Action Alternative – Section 2.3 of the EA

Under the No Action Alternative, the Proposed Action would not occur. Arnold AFB would not establish an OHV program, and recreational activities would continue as currently conducted on the installation.

Environmental Consequences – Chapter 4 of the EA

Proposed Action: OHV Trail System and Motocross Area

At this time, exact trail locations have not been determined; the EA serves to evaluate the proposed area and provide suitability ratings for the area based on various resources and associated constraints. The entire proposed OHV area, including the motocross area, has been evaluated to identify locations that may be suitable for OHV trail development and use. The proposed area was categorized based on particular resource areas and their associated constraints. As an example, wetlands have been identified as an avoidance area, and trails would be limited to existing firebreaks/forestry roadways within these areas with applicable restrictions/mitigations to minimize direct and indirect impacts. No new trails would be developed within 50 feet of a designated wetland area, while new trail development would be avoided to the extent practicable within 250 feet of a wetland area. If trails are developed within 250 feet of wetland areas, then management actions and best management practices (BMPs) would need to be implemented to minimize any potential adverse impacts. This process was applied to the entire OHV area for the following resource areas: geomorphology and soils, water quality and hydrology, biological resources, cultural resources, and environmental restoration sites. A summary of the constraint rating for the area is provided in Section 4.9 of the EA. Other resources areas were also addressed (land use, safety, and air quality); however, these resources do not have any associated spatial constraints.

Impacts under the Proposed Action are associated with development, operation, and maintenance of the OHV trail system and motocross area. Impacts are mainly related to safety concerns and erosion impacts associated with OHV use. While there is potential for adverse impacts associated with all the resources areas (with the exception of air quality), all impacts can be mitigated through implementation of avoidance measures and other management actions and BMPs listed in Chapter 5 of the EA. Designating trail routes within the proposed area and restricting cross-country riding would serve to reduce stream sedimentation and erosion on steep slopes and allow for improvements and proper design of trails at creek crossings. Trail protection or prevention of trail degradation and off-site damages could be accomplished to a large extent by careful selection of trail location, design, graveling, and maintenance. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system utilizing, to the extent possible, existing road systems and fire breaks within the area. The trail system would be established in such a manner to avoid wetlands and minimize stream crossings and interaction with highly erodible soils. If such areas are utilized, operational constraints would be implemented that would minimize impacts in these areas, such as restricted use in wet soils and speed limits. At the motocross

area, the riding track would be developed based on constraints associated with the type of soils present at the location. Such considerations would include grading jump and curve slopes based on the erodibility of soil types.

None of the potential impacts identified have been determined as significant.

Alternative 1: Motocross Area Only

No significant adverse impacts have been identified under Alternative 1. While there are some constraints associated with Alternative 1 (see Section 4.9 of the EA), impacts associated with the construction, operation, and maintenance of the proposed motocross area would have minimal adverse impacts as compared to the Proposed Action. The area is currently cleared of trees, and no wetlands, water bodies, sensitive species, environmental restoration sites, or cultural resources exist within the area. Erosion BMPs and management actions would still need to be implemented at this area.

No Action Alternative

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

Public/Agency Review

The Air Force published a public notice in the *Tullahoma News, Herald Chronicle,* and *Manchester Times* once per week for four weeks starting on 24 March 2010 notifying the public of the Air Force's intent to sign a FONSI. The Air Force also provided the following agencies copies of the EA for review and comment: Tennessee Department of Environment and Conservation (TDEC) Office of General Counsel, TDEC Historical Commission, TDEC Division of Natural Heritage, TDEC Division of Recreation Services, TDEC Division of Water Pollution Control, and TDEC Division of Air Pollution Control, the Tennessee Wildlife Resources Agency, and the U.S. Fish and Wildlife Service.

The public comment and agency review period ended on 24 April 2010. No public or agency comments were received.

Conclusion

The attached EA was prepared pursuant to 32 Code of Federal Regulations (CFR) 989 and U.S. Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) for

implementing the procedural requirements of the National Environmental Policy Act (NEPA). The finding of this EA is that the neither the Proposed Action nor Alternative 1 would have significant impact on the human or natural environment provided all restrictions are implemented. A Finding of No Significant Impact (FONSI) is issued, and no Environmental Impact Statement (EIS) is required.

Restrictions – Chapter 5 of the EA

Chapter 5 of the EA provides an extensive list of applicable resource-specific plans, permits, and management requirements needed to implement the Proposed Action and Alternative 1.

Saroya F. Follender — 5 May 2010

Lt Col Saroya Follender — Date
Commander, 704th Civil Engineer Squadron (AFMC)

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List of Acronyms, Abbreviations, and Symbols

704 CES/CEA	704 Civil Engineering Squadron, Asset Management
ACAM	Air Conformity Applicability Model
AEDC	Arnold Engineering Development Center
AFB	Air Force Base
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AICUZ	Air Installation Compatible Use Zone
APE	Area of Potential Effects
AQCR	Air Quality Control Region
ATV	All-terrain vehicle
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
D	Deemed in Need of Management
dB	Decibel
DM	Delisted Taxon
DNA	Division of Natural Areas
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FWI	Fighter Wing Instruction
GIS	Geographic Information System
HQ	Headquarters
INRMP	Integrated Natural Resources Management Plan
IPP	Invasive Pest Plant
IRP	Installation Restoration Program
JAMA	Journal of the American Medical Association
kg/m^2	Kilogram per Square Meter
L_{max}	Maximum Sound Level
LUC	Land Use Control
m^3/m^2	Cubic Meter per Square Meter
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
OHV	Off-Highway Vehicle
OSHA	Occupational Safety and Health Administration
$PM_{2.5}$ or PM_{10}	Particulate Matter less than or equal to 2.5 or 10 microns, respectively, in diameter

POL	Petroleum, Oils, Lubricants
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RTE	Rare, Threatened, or Endangered
S	Special Concern
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SWMU	Solid Waste Management Unit
T	Threatened
TCA	Tennessee Code Annotated
TDEC	Tennessee Department of Environment and Conservation
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
WQA	Water Quality Act

1.0 Purpose and Need for Action

1.1 Background

Arnold Air Force Base (AFB) is located in Coffee and Franklin Counties in middle Tennessee. The Base is approximately 70 miles southeast of Nashville, the state capitol, and near the towns of Manchester, Tullahoma, and Winchester. Arnold AFB is the largest employer in the two-county area (Figure 1-1).

Arnold AFB occupies 39,081 acres, including the 3,632-acre Woods Reservoir and various sectors of improved, semi-improved, and unimproved grounds. The base has 5,494 acres of cultivated pine forests and 23,053 acres of hardwood forests (U.S. Air Force, 2006). Grasslands and early successional habitats in utility rights-of-way provide 2,219 acres of habitat for numerous rare species. Arnold AFB contains 1,894 acres of jurisdictional wetlands. The remaining 4,683 acres are occupied by wildlife food plots, buildings/structures, mowed/bushhogged areas, and other open areas (U.S. Air Force, 2006).

1.1.1 Operations

Arnold Engineering Development Center (AEDC), which is located on Arnold AFB, is the most advanced and largest complex of flight simulation test facilities in the world, with 58 aerodynamic and propulsion wind tunnels, rocket and turbine engine test cells, space environmental chambers, arc heaters, ballistic ranges, and other specialized units. Facilities can simulate flight conditions from sea level to altitudes of more than 100,000 feet and from subsonic velocities to those well over Mach 14.

1.1.2 History

Arnold AFB is named for the late General Henry H. "Hap" Arnold, Commander of the Army Air Forces. In 1949, Congress authorized $100 million for the construction of AEDC. On 25 June 1951, one year after General Arnold's death, President Harry Truman dedicated the AEDC.

1.1.3 Military Mission

The existing military mission is to support the development of aerospace systems by testing hardware in facilities that simulate flight conditions. As part of Arnold AFB's overall mission, the base supports armed forces combat readiness by providing sustained realistic military training environments. Ecosystem management helps maintain natural landscapes for this military training.

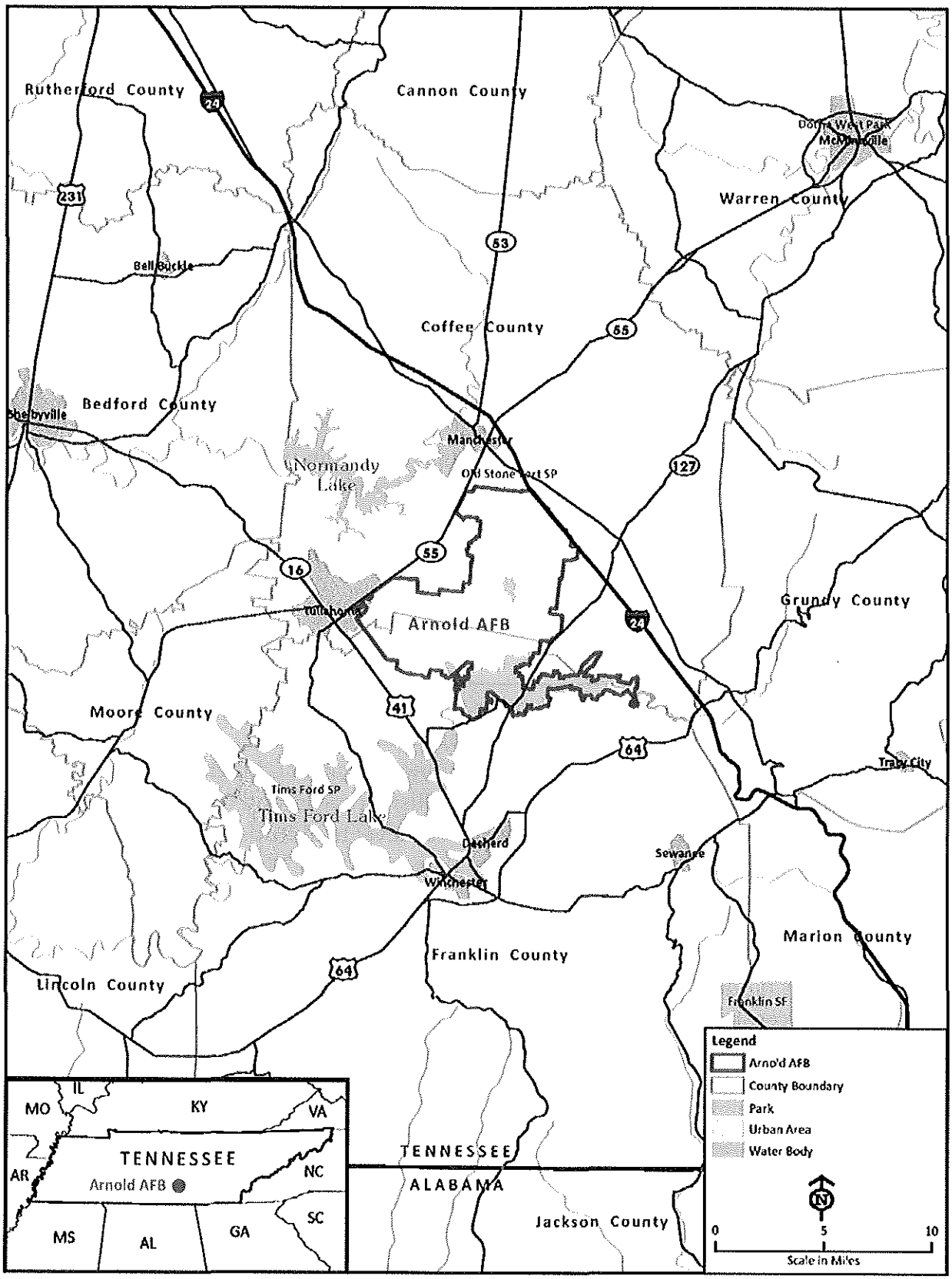

FIGURE 1-1
LOCATION OF ARNOLD AFB, TN
Establishment of an Off-Highway Vehicle (OHV) Program at Arnold Air Force Base, Tennessee

1.2 Proposed Action

Arnold AFB proposes to establish an off-highway vehicle (OHV) program. Within the context of this document, OHV refers to four-wheel all-terrain vehicles (ATVs) (including side-by-sides) and off-highway motorcycles (motocross, or dirt bikes). The proposed riding area is located north of Wattendorf Highway and just west of the AEDC Test Area within the fenced portion of Arnold AFB. The entire OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails, to include a small area (approximately 15 acres) set aside for motocross riding, consisting of berms and jumps. Access to the OHV area would be limited to base personnel (both civilian and military), their dependents, and guests. Arnold AFB would establish a program to manage the area by (1) providing permits to operate OHVs within the area, (2) monitoring for compliance with Department of Defense (DoD) and Arnold AFB OHV riding requirements, and (3) maintaining the OHV area trails and motocross area. The exact mileage and location of the trail system within the proposed OHV riding area has yet to be determined and would be dependent on environmental constraints identified in this environmental assessment (EA), as well as costs to develop and maintain the trail system. An alternative to the Proposed Action would be to develop and maintain only the motocross area as opposed to both the OHV trail system and the motocross area.

1.3 Need for Proposed Action

The need for the OHV riding area is associated with increased interest by base personnel to have a local area for OHV recreational activities.

1.4 Applicable Regulatory Requirements, Permits, and Coordination

The following regulations, permits, or coordination are addressed in this EA:

- Executive Order (EO) 11644, *Use of Off-Highway Vehicles on the Public Lands*
- Air Force Instruction (AFI) 91-207, *The U.S. Air Force Traffic Safety Program*
- National Environmental Policy Act (NEPA) and implementing regulations
- National Historic Preservation Act (NHPA)
- 32 Code of Federal Regulations (CFR) 989, *Environmental Impact Analysis Process*
- AFI 32-7064, *Integrated Natural Resources Management*

- Endangered Species Act (ESA)
- Fish and Wildlife Coordination Act
- Clean Water Act (CWA)
- Water Quality Act (WQA)
- EO 11990, *Protection of Wetlands*
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as amended by the Superfund Amendments and Reauthorization Act [SARA])
- Archeological Resources Protection Act
- Department of Defense Instruction (DoDI) 4715.3, *Environmental Conservation Program*
- AFI 32-7065, *Cultural Resources Management Program*
- EO 11988, *Floodplain Management*
- Clean Air Act (CAA)
- Antiquities Act
- Historic Sites Act
- Archaeological and Historic Preservation Act
- Archaeological Resources Protection Act
- Native American Graves Protection and Repatriation and Protection Act
- American Indian Religious Freedom Act
- 36 CFR 800, *Protection of Historic Properties* (incorporating amendments effective 05 August 2004)
- 36 CFR 63, *Determinations of Eligibility for Inclusion in the National Register*
- EO 11593, *Protection and Enhancement of the Cultural Environment*
- EO 13007, *Indian Sacred Sites*
- EO 13287, *Preserve America*

The Air Force published a public notice in the *Tullahoma News, Herald Chronicle,* and *Manchester Times* once per week for four weeks starting on 24 March 2010 notifying the public of the Air Force's intent to sign a Finding of No Significant Impact (FONSI). The Air Force also provided the following agencies copies of the EA for review and comment: Tennessee Department of Environment and Conservation (TDEC) Office of General Counsel, TDEC Historical Commission, TDEC Division of Natural Heritage,

TDEC Division of Recreation Services, TDEC Division of Water Pollution Control, and TDEC Division of Air Pollution Control, the Tennessee Wildlife Resources Agency, and the U.S. Fish and Wildlife Service.

The public comment and agency review period ended on 24 April 2010. No public or agency comments were received.

1.5 Authority and Scope of the EA

This document was prepared in accordance with the requirements of the NEPA of 1969, the Council on Environmental Quality (CEQ) regulations of 1978, and 32 CFR 989.

1.6 Issues Eliminated from Detailed Analysis

The resource areas discussed below have been eliminated from detailed analysis in this document because there is no potential for the Proposed Action to impact these resources.

1.6.1 Air Installation Compatible Use Zone (AICUZ)

Arnold AFB has an active airfield and an exemption from Headquarters (HQ) Air Force Materiel Command (AFMC) for AICUZ because of the limited number and types of flying operations. The proposed project area is not within any accident potential zones and would not impact airfield operations or management. Therefore, AICUZ was eliminated as an issue warranting further analysis.

1.6.2 Geology

Proposed trail development and maintenance activities would be limited to the ground surface, possibly to a depth of several feet. While there may be impacts to soils within the project area, underlying geology is not expected to be impacted by the Proposed Action, and this issue was not carried forward for detailed analysis.

1.6.3 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify community issues of concern during the NEPA process, particularly those issues relating to decisions that may have an impact on low-income or minority populations. The proposed project would not affect communities outside Arnold AFB, to include low-income or minority

populations. Therefore, the Air Force does not anticipate impacts associated with environmental justice from the Proposed Action, and further analysis is not warranted.

1.6.4 Traffic Flow

The Proposed Action is not expected to result in any significant increases in on-base traffic. While there may be slight, short-term increases in traffic to the riding area on weekends, the OHV area would not be accessible to the public and would not result in any additional traffic over and above that normally seen on Arnold AFB on a typical weekday. As a result, the Air Force does not anticipate any significant adverse impacts to transportation.

1.6.5 Utility Infrastructure

There would be no utility construction or use associated with the proposed project. As a result, the Air Force does not anticipate any impacts to utility infrastructure on Arnold AFB.

1.6.6 Hazardous Materials

There would be minimal use of hazardous materials associated with the OHV riding area associated with fueling and on-site spot/emergency maintenance for equipment used during development and maintenance of the OHV. These activities would be conducted in accordance with applicable hazardous materials handling instructions and spill prevention measures. Course development and maintenance activities would not utilize any hazardous materials. Fueling and maintenance of OHVs themselves would occur off-site. As a result, the Air Force has not identified any impacts associated with hazardous materials and/or waste.

1.6.7 Socioeconomics

Socioeconomic impacts would be limited to Arnold AFB and would be associated with the revenue from permitting for OHV recreation on the installation. Permitting fees would be utilized for maintaining the OHV program, so it is likely that there would be no net increase in recreational permitting revenue for Arnold AFB. The OHV program would support only a small trail system and motocross challenge area, which is not likely to negatively impact in any appreciable manner other, much larger OHV riding areas that are near Arnold AFB. Consequently, the Air Force has not identified any potential socioeconomic impacts, and this issue was not carried forward for detailed analysis.

1.7 Issues Studied in Detail

The resource areas below are discussed in detail in this document:

- Land Use
- Safety
- Biological Resources
- Cultural Resources
- Geomorphology and Soils
- Water Quality and Hydrology
- Air Quality
- Noise

1.8 Document Organization

This EA follows the organization established by the CEQ regulations (40 CFR 1500–1508). This document consists of the following sections:

1.0 Purpose and Need for Action

2.0 Description of the Proposed Action and Alternatives

3.0 Existing Conditions

4.0 Environmental Consequences

5.0 Plan, Permit, and Management Requirements

6.0 List of Preparers

7.0 References

Appendices

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2.0 Description of Proposed Action and Alternatives

As required by federal regulations, this EA addresses the possible environmental impacts of a No Action Alternative and the practicable action alternatives. This section provides a description of the action alternatives and the No Action Alternative and a brief discussion of the impacts associated with each alternative. At this time, a trail system has not been identified. This EA identifies constraints and potential impacts from developing, operating, and maintaining a trail system within the proposed area. Based on the results of the analysis in this document, Arnold AFB would identify a suitable trail system that would avoid negative impacts to wetlands, provide for safe riding conditions, allow for the control of white-tailed deer through late season hunts by halting all OHV riding, and would be designed for reduced maintenance cost.

2.1 Proposed Action

The Proposed Action is for Arnold AFB to establish an OHV program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB (Figure 2-1). The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding, consisting of berms and jumps. An approximately 10,000-square-foot gravel parking and loading/unloading area for the users would also be developed. Implementation of the Proposed Action would involve three components: development, operation, and maintenance.

Development of the OHV Program and Riding Area – This component is the initial stage of Proposed Action implementation and involves initial program development and physical development of the OHV area.

Initially, the OHV program requirements would be developed, including deconflicting existing operational restrictions and developing new operating instructions and requirements for OHV activity at Arnold AFB. Operation of OHVs on Arnold AFB is currently prohibited by the Arnold AFB *Integrated Natural Resources Management Plan* (INRMP) (U.S. Air Force, 2006). As a result, the Arnold AFB INRMP would need to be amended accordingly, and instructions for the operation of an OHV area would need to be developed. Any instruction developed by Arnold would be in compliance with AFI 91-207, *The U.S. Air Force Traffic Safety Program* (22 May 2007). This initial component would also establish a permitting process to operate OHVs within the area and identify monitoring procedures for compliance with DoD and Arnold AFB OHV riding requirements.

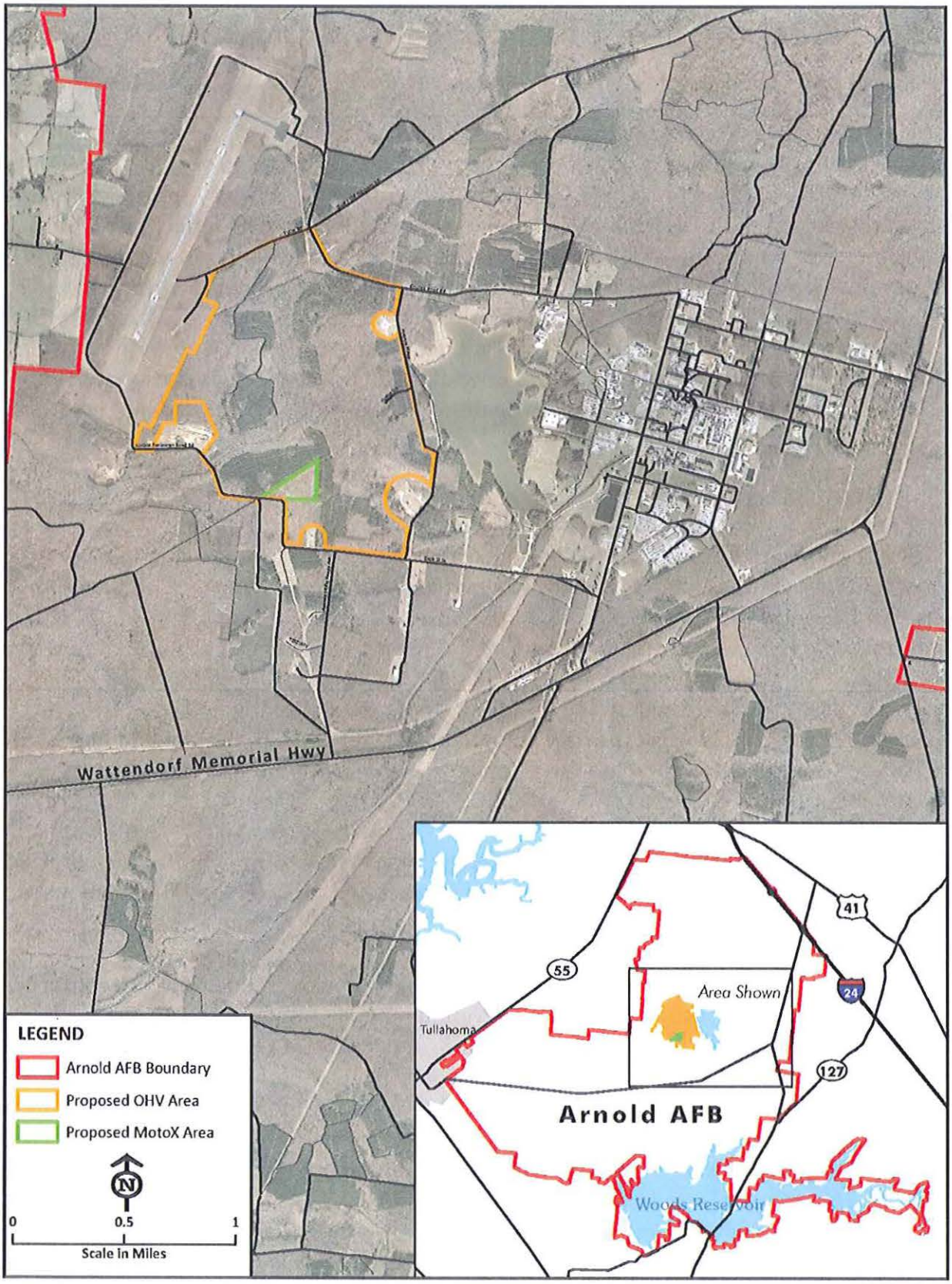

FIGURE 2-1
LOCATION OF PROPOSED ACTION
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Identification and physical development of OHV trail locations would follow initial program development. Identification of the trail system would be constrained by (1) the initial start-up cost of making trails and (2) the cost to maintain the trails. In keeping with the Arnold AFB INRMP, Arnold AFB would identify a suitable, low-impact trail system within the proposed OHV area appropriate to the budget available for the OHV program (considering available recreational program funds to include proceeds from projected user fees) and based on the results of the analysis within this EA.

Designating trail routes within the proposed area, and restricting cross-country riding, would serve to reduce stream sedimentation and erosion on steep slopes and allow for improvements and proper design of trails at creek crossings. Trail protection or prevention of trail degradation and off-site damages could be accomplished to a large extent by careful selection of trail location, design, graveling, and maintenance. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system utilizing, to the extent possible, existing road systems and fire breaks within the area. The trail system would be established in such a manner to avoid wetlands and minimize stream crossings and interaction with highly erodible soils. If such areas are utilized, then operational constraints would be developed that would minimize impacts in these areas, such as restricted use in wet soils and speed limits. At the motocross area the riding track would be developed based on constraints associated with the type of soils present at the location. Such considerations would include grading jump and curve slopes based on the erodibility of soil types.

Once the trail system is identified, procedures for maintaining the OHV area trails and motocross area would then be developed. Maintenance of the areas would utilize practices that would maintain the integrity of the trail system and motocross area while at the same time ensuring minimal impact to environmental resources in accordance with Arnold AFB INRMP policies. Such practices are identified in this EA based on environmental considerations.

Operation of the OHV Area – Operation of the OHV area consists of the utilization of the established trail system and motocross area by permitted users. Operation would be in accordance with established Arnold AFB procedures (developed in the first phase). Users would need to stay on the identified trail system or within the motocross area as applicable and follow all identified usage/safety procedures. The OHV (including motocross) areas would be available for use from after business hours (after 4:00 PM) until dusk during weekdays and from dawn to dusk during the weekends and holidays. However, access could be restricted at certain times during the year for the following purposes:

- **Unfavorable ground conditions and weather** – Instances where the ground surface is saturated from excessive rains/moisture resulting in the potential for excessive trail degradation, or weather conditions make riding too dangerous.
- **Hunting** – The trail area would be closed during gun season during mid-November through the first weekend in January on a yearly basis in order to avoid safety issues; the motocross area would remain open.
- **Maintenance** – OHV area maintenance would typically occur during weekdays and periods of normal closure. However, there may be instances where extended maintenance would require closures during established operating hours.
- **Military mission needs** – While the occurrence of these types of closures are not predictable, there may be occasions where military missions occurring at Arnold AFB would result in occasional closures of the OHV area.
- **Forest management activities** – The proposed OHV area is located in an area that contains forest stands that are actively managed as part of Arnold AFB's natural resources management plan. Management includes typical activities such as stand thinning and prescribed burning; such activities may require closure of the area.

Certain trail areas that are within areas highly susceptible to erosion or degradation during wet periods could also be restricted from use. The extent of use of these areas cannot be determined at this time, as the potential interest of this recreational activity is difficult to gauge. As a result, for purposes of analysis, three utilization scenarios based on potential trail length, "rider hours," and number of passes along the trail system and within the motocross area are considered in this EA. It is assumed that the trail length would be approximately 5 miles in length and would be a one-way system. Rider hours consist of the amount of time spent on the trails and the motocross track, with the assumption that the time would be spent equally across the length of the trail system or within the motocross area. One rider hour is equal to one rider spending one hour within the area. The extent of rider use would dictate the rate of trail degradation and the need for maintenance.

There are approximately 4,400 hours of daylight in a year, averaging 12 hours of daylight per day. There are 52 weekends in a year, and an average of 10 holidays per year, with three extra days typically taken during Thanksgiving, Christmas, and New Years, respectively. The OHV trail system would be closed for approximately 1.5 months during the winter, which excludes six weekends and six holiday days. As a result, the OHV area would be available for use approximately 46 weekends and seven holidays (99 full days = 1,188 hours), plus 129 weekdays (averaging approximately four hours per weekday = 516 hours). This equates to approximately 1,704 hours of available use, with peak usage typically occurring on weekends and holidays.

- **Low** – *Low use* of the OHV area consists of the trail system and motocross area utilized approximately 35 percent of the available time by riders. For example, at low use, the trail system would be utilized at around 596 hours or less per year. These 596 "rider hours" could consist of a single rider or multiple riders at the same time. Typical speed limits for OHV riding areas are between 15 to 20 miles per hour. As a result, it is estimated that with a 5-mile trail system approximately 1,789-2,384 trail passes could be made in a year by a single rider if used constantly during the time available (derived by taking the speed limit of 15 miles per hour for the low end and 20 miles per hour for the upper end and dividing by 5 miles to determine the number of passes per hour under each speed limit, then multiplying each by 596 available hours), with the majority of these happening during peak hours on weekends, holidays, and during summer months. Although multiple riders could be utilizing the area at the same time, the number of trail passes that would constitute low usage would be between 1,789 and 2,384 trail passes (at 15 miles per hour and 20 miles per hour, respectively) in a year.
- **Moderate** – *Moderate use* would consist of riders using the trail system from between 35 percent and 60 percent of the available time. Using the aspects described for low use, moderate use would result in approximately 596 to 1,022 hours and 1,789 to 4,090 trail passes (at 15 miles per hour and 20 miles per hour, respectively) per year. Again, these rider hours could consist of a single rider or multiple riders at the same time with the majority of these happening during peak times.
- **High** – *High use* would consist of riders utilizing the proposed area for more than 60 percent of the available time: 1,022 to 1,704 hours and 3,066 to 6,816 trail passes (at 15 miles per hour and 20 miles per hour, respectively) per year with the majority of these happening during peak times.

Rider use would be tracked through the permitting process and sign-in/sign-out procedures.

Maintenance of the OHV Area – Maintenance of the OHV area includes track clearing, such as removal of hazardous debris such as fallen trees or limbs, and repairs to environmental degradation such as grading and graveling to fix rutted areas. In some cases vegetation may be cleared to minimize line-of-site issues. For the motocross area, maintenance would consist of grading jump and curve slopes, removal of hazardous debris, and repair of any environmental degradation. In most cases the nature of OHV maintenance activities would be low-impact, consisting of manual labor to remove trees and other debris (chain saws for trees and limbs); however, vegetation clearing may require machinery, depending on the type of vegetation removed (e.g., a mower/bush hog for tall grasses). For the motocross area, a grader or possibly a Bobcat would need

to be used for grading or repairing the jump and curve slopes, while a bush hog or mower could be needed for vegetation control.

2.2 Alternative 1: Motocross Area Only

Alternative 1 would consist of the motocross area only; development, operation, and maintenance of the motocross area would occur as described under the Proposed Action, with consideration of the motocross area only.

Existing operational restrictions and development of new operating instructions and requirements for OHV activity at Arnold AFB would need to occur. Development of a permitting process to operate OHVs within the area and identification of monitoring procedures for compliance with DoD and Arnold AFB OHV riding requirements would be required.

Physical development of the motocross course would also be constrained by (1) the initial start-up cost of development and (2) the cost of maintenance. In keeping with the Arnold AFB INRMP, Arnold AFB would develop the course appropriate to the budget available and based on the results of the analysis within this EA.

The motocross area would be established in such a manner to avoid wetlands, stream crossings, and interaction with highly erodible soils.

Operation and maintenance of the motocross course would also be similar to that described under the Proposed Action. Operational analysis of this area within the EA is based on the "rider hours" concept described previously.

2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. Arnold AFB would not establish an OHV program and recreational activities would continue as currently conducted on the installation.

Although the No Action Alternative would not meet the purpose and need for the Proposed Action, NEPA-implementing regulations require analysis of the No Action Alternative. Essentially, the impacts associated with the No Action Alternative represent the environmental impacts at the proposed locations if the Proposed Action were not implemented. Under the No Action Alternative, there would be no "Proposed Action-related" impacts, but ongoing and potential future actions not related to the Proposed Action would continue to influence the resources in the area.

2.4 Comparison of Alternatives Carried Forward

TABLE 2-1
COMPARISON OF ALTERNATIVES
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Resource Area	*Proposed Action*	*Alternative 1 – Motocross Area Only*	*No Action Alternative*
Land Use	Land use impacts are essentially associated with use conflicts between recreational users: hunters and OHV riders. To minimize this conflict, the OHV area would be closed to OHV riders during hunting seasons.		The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.
Safety	There are inherent safety issues associated with OHV use; Arnold AFB would implement an OHV rider safety requirements and Standard Operating Procedure to outline safety requirements to minimize accident potential.		
Biological Resources	Sensitive habitats and species are located within the proposed OHV area. Potential adverse impacts to biological resources are mainly associated with potential trail development and use in sensitive species habitat. Such areas have been identified as areas that either must be avoided or should be avoided in the absence of extensive mitigations, based on the significance of the occurrence. Provided these requirements are met, no significant adverse impacts are anticipated.	No adverse impacts have been identified for Alternative 1; the proposed motocross area is clear of biological resource constraints.	
Cultural Resources	There are cultural resource sites located within the proposed OHV area; such areas have been identified as areas that must be avoided. Provided these requirements are met, no significant adverse impacts are anticipated.	No adverse impacts have been identified for Alternative 1; the proposed motocross area is clear of cultural resource constraints.	
Geomorphology and Soils	Potential impacts are associated with erosion potential. Highly erodible soils and those areas susceptible to saturation have been identified as areas that should be avoided in the absence of extensive mitigations. Other areas would need to incorporate standard best management practices (BMPs) and management actions to minimize erosion impacts. Monitoring of OHV areas would also need to be conducted to ensure the effectiveness of these measures. Provided these requirements are met, no significant adverse impacts are anticipated.		
Water Quality and Hydrology	Surface waters and wetlands are located within the proposed OHV area. Potential adverse impacts to these resources are mainly associated with potential trail development and use in these areas. Such areas have been identified as areas that either must be avoided (wetlands) or should be avoided in the absence of extensive mitigations (stream buffers). Provided these requirements are met, no significant adverse impacts are anticipated.	No adverse impacts have been identified for Alternative 1; the proposed motocross area is clear of water resource constraints.	
Air Quality	There would be air emissions associated with OHV trail development, use, and maintenance (particulate matter and carbon monoxide). However, these emissions are not anticipated to result in adverse air quality impacts. Implementation of BMPs for dust control would serve to minimize any impacts associated with particulate matter.		
Noise	Adverse impacts are associated with annoyance of wildlife species in and around the area. Some species may flee the area while others may become acclimated to the noise over time. No significant adverse impacts have been identified.		

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3.0 Existing Conditions

3.1 Land Use

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

There are no specific regulations associated with land use activities other than Air Force standards. Guidelines are generally adopted from publications such as *Guidelines for Considering Noise in Land-Use Planning and Control* published by the Federal Interagency Committee on Urban Noise, and the U.S. Department of Transportation's *Standard Land Use Coding Manual*. Under AFI 32-7064, *Integrated Natural Resources Management*, land use regulations must also be written to support the natural resources management goals and objectives in the INRMP.

The land use resource also includes Installation Restoration Program (IRP) sites. The IRP is used by the Air Force to identify, characterize, clean up, and restore sites contaminated with toxic and hazardous substances; low-level radioactive materials; petroleum fuels; or other pollutants and contaminants. Depending on their status, IRP sites may pose a constraint to development or may be incompatible with certain land uses. For example, sites undergoing active remediation may have associated infrastructure, such as groundwater wells, pumps, or piping, that must be avoided. Others IRP sites may be subject to regulatory-driven land use controls (LUCs) that prohibit disturbance of soils or use of underlying groundwater.

The potential presence of unexploded ordnance (UXO) from historic use may also pose a land use constraint and would be incompatible with most land uses. This section does not consider the potential for encountering UXO during construction and/or maintenance activities or OHV use, as Arnold AFB personnel indicate that there is little potential for encountering UXO from historic use on proposed OHV areas (Flatt, 2010).

Land Use – Arnold AFB comprises a mixture of administrative, community, and recreational land use. Other areas of the installation are generally undeveloped or associated with training or airfield operations (i.e., runways, taxiways, and aprons). The Proposed Action affects outdoor recreation areas.

DoD installations are to provide for sustained public access and use of natural resources for educational or recreational purposes when such access is compatible with mission activities and with other considerations such as security, safety, or resource sensitivity. Management of outdoor recreation areas is the responsibility of the Natural Resources Manager under the 704th Environmental Flight. Outdoor recreational areas have been divided into four classes of use:

- ***Class I Areas*** are categorized as ***developed recreation areas*** and typically include facilities designed to accommodate intensive recreational activities such as sports, campgrounds, picnic areas, paved walking/jogging/cycling trails, marinas, designated swimming beaches, and other water sports areas. Class I Areas at Arnold AFB that are open to the general public include the Morris Ferry Recreation Area, the Golf Course, and seven boat ramps.
- ***Class II Areas*** are categorized as ***dispersed recreation areas*** and are areas that are suitable to support dispersed recreational activities such as hunting, fishing, primitive camping, bird watching, boating, hiking, and sightseeing.
- ***Class III Areas*** are categorized as ***special interest areas*** and are typically recreation areas that contain valuable archeological, botanical, ecological, geological, historical, zoological, scenic, or other features that warrant special protection and access control.
- ***Class IV Areas*** include ***recreation areas that are not open to the general public.*** Access to these areas is limited to Arnold AFB affiliated users. At Arnold AFB these areas include clubs and activities sponsored by Arnold AFB and other individual organizations such as the Boy Scouts (Camp Arrowhead). Arnold-sponsored recreation clubs that are not open to the general public but are open to Arnold AFB affiliated users include the Highland Yacht Club, Water Ski Club, Skeet Shooters Club, Highland Rim Shooters Club, Family Camp, and the Air Foilers Club.

The proposed OHV location is within the AEDC Security Area. This area is restricted to users of the AEDC area who have mission-related functions. Hunting is allowed within the AEDC Security Area as defined by the AEDC Security Area Hunting Regulations. Only active duty military, DoD civilians, and contractor employees with permanently assigned pictured badges and their dependents are allowed to hunt within the AEDC Security Area. In addition to the required state licenses, Arnold AFB permits must be obtained through the Arnold AFB Conservation Office. The area identified for the Proposed Action is classified as a Class IV area and is open for archery, shotgun, and muzzleloader hunting to Arnold AFB employees and their guests.

IRP Sites – The IRP is used by the Air Force to identify, characterize, clean up, and restore contaminated sites. Since implementation in 1982, 26 IRP sites have been

identified at the base. Approximately one-half of the identified sites require no further action and are considered closed. Remaining sites are undergoing active remedial actions or are part of ongoing monitoring programs (U.S. Air Force, 2004).

There are three IRP sites located within, or in proximity to, the proposed OHV area (Figure 3-1). Table 3-1 describes these three sites and summarizes their regulatory status.

TABLE 3-1
IRP SITES LOCATED IN PROXIMITY TO PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Site Name	*Description*	*Regulatory Status*
SS-17 (SWMU 21)	Burn Area 2	No Further Action Required/Considered Closed
SD-14 (SWMU 18)	Crumpton Creek	No Further Action Required/Considered Closed
WP-12 (SWMU 16)	Retention Leach/Burn Area	Undergoing Active Remediation Measures

SWMU = solid waste management unit

3.2 Safety

Safety is defined as any issue with a potential to increase health risks to military or DoD civilian personnel or the general public. This section defines potential safety issues associated with OHV trail and maintenance activities and OHV operations.

A variety of Air Force regulations address safety associated with development activities (including construction and maintenance of riding trails). Primary among these is AFI 91-302, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Standards* (U.S. Air Force, 1994). Under 29 CFR 1960 series, Occupational Safety and Health Administration (OSHA) standards do not apply to military-unique workplaces, operations, equipment, and systems. However, according to DoD instruction, they apply insofar as is possible, practicable, and consistent with military requirements. AFI 91-302 AFOSH standards apply unless specifically exempted by variance or determined to be an acceptable deviation.

Day-to-day development and maintenance activities conducted by staff at Arnold AFB are performed in accordance with applicable Air Force safety regulations, published Air Force technical orders, and standards prescribed by AFOSH requirements. Developers working on the installation are required to prepare appropriate job site safety plans explaining how job safety will be assured throughout the life of the project. Developers are also required to follow applicable OSHA requirements.

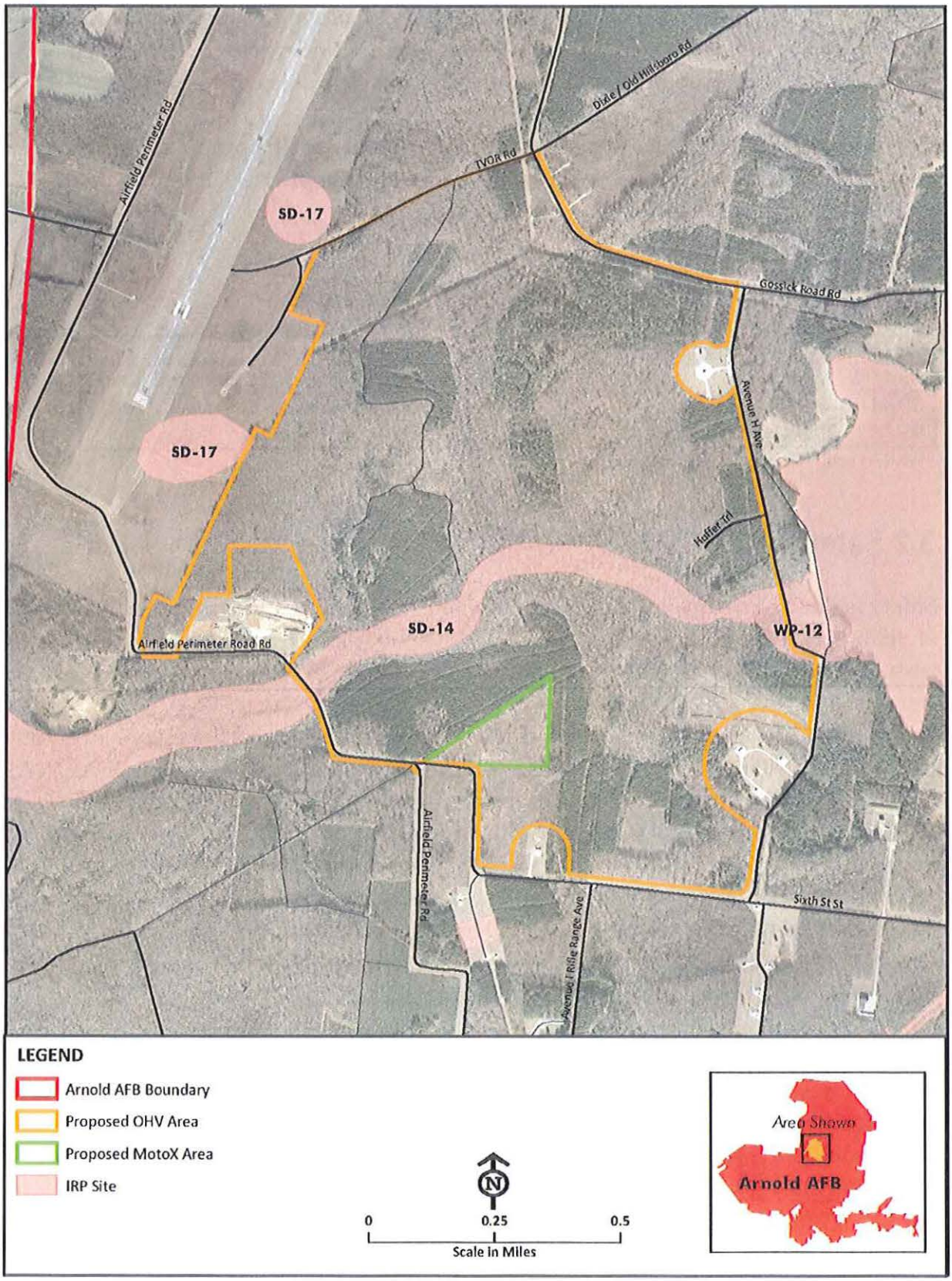

FIGURE 3-1
IRP SITES LOCATED IN PROXIMITY TO THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

With respect to operation of OHVs on federal lands, EO 11644 prescribes that each agency shall develop and publish regulations for operation of these vehicles. Among other elements, these regulations shall be directed at preserving public health, safety, and welfare. EO 11644 also requires that installations ensure that areas and trails where OHV use is permitted are well marked and shall provide for the publication and distribution of information, including maps, describing such areas and trails and explaining the conditions of vehicle use. Additionally, AFI 91-207, *U.S. Air Force Traffic Safety Program*, presents requirements to prevent or reduce the frequency and severity of vehicular mishaps involving Air Force personnel, equipment, and operations. The AFI includes traffic safety training course definitions and requirements (including motorcycle and ATV operator training requirements) and specifies personal protective equipment (PPE) requirements, such as the use of approved helmets and OHV riding equipment (U.S. Air Force, 2007a).

Currently, there is no authorized use of motorized OHVs for outdoor recreation on Arnold AFB.

Finally, Tennessee Code Title 70, *Tennessee Off-Highway Vehicle (OHV) Act*, regulates OHV use. The statute is designed to maximize OHV economic and recreational opportunities, to protect the environment, and to ensure that adequate revenue is generated for such purpose. The statute requires that any person using an off-highway motor vehicle upon the land of another must first obtain the permission or approval of the owners of the land. The statute also requires that riders under 18 years of age using publicly owned or leased lands shall, at a minimum, wear a helmet (Tennessee Code 70-9-105).

3.3 Biological Resources

This section evaluates biological resources within the proposed OHV area, which includes the proposed motocross area. The evaluation area covers about 714 acres; the proposed motocross area consists of 14.4 acres within that area. Roughly 710 acres of this area consists of various types of natural forests, pine plantations, woodlands, and grasslands. The remaining 4 acres consists of roads, lawns, and other human-created structures.

Flora and Fauna

Proposed OHV Area

The proposed OHV area contains a moderately diverse assemblage of plant communities (Figure 3-2 and Table 3-2). Existing firebreaks and forestry roads/trails are also shown in Figure 3-2.

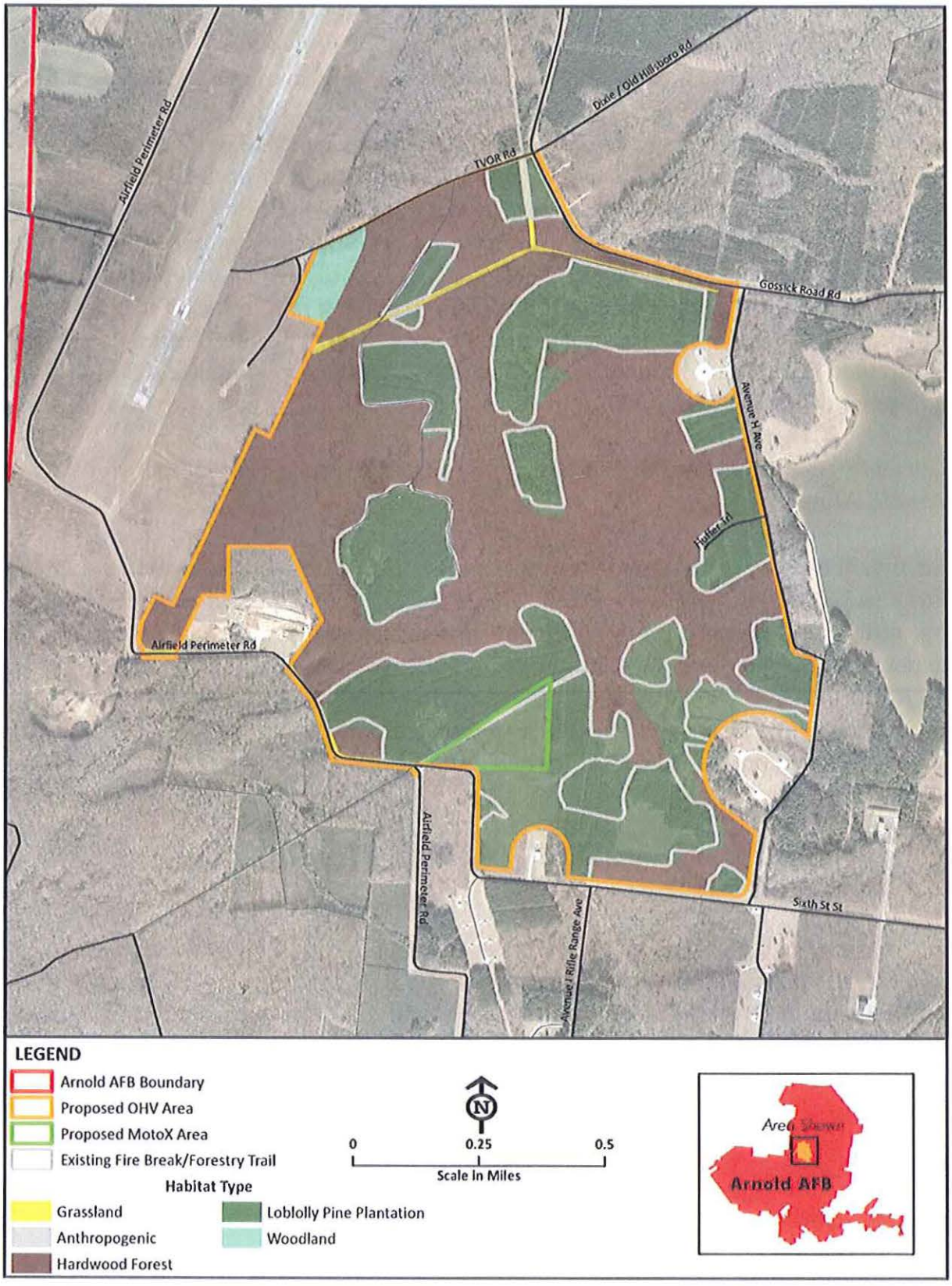

FIGURE 3-2
VEGETATION TYPES AT THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Lowland or submontane cold-deciduous forests occupy about 55 percent of the proposed OHV area. White Oak - Mixed Hickory forests and Southern Red Oak - Scarlet Oak forests are by far the dominant hardwood forest type with lesser amounts of White Oak - Mixed Oak and Southern Red Oak - White Oak forests. Loblolly Pine plantations occupy almost 42 percent of the total OHV evaluation area; the proposed motocross site is planted with loblolly pine seedlings less than two years old. Woodland habitat occupies 1.3 percent of the proposed OHV area; post oak woodlands and eastern redcedar woodlands are about equally represented. Upland Grassland Association represents a small component (approximately 1 percent) of the area.

TABLE 3-2
VEGETATION COMMUNITIES AT PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Vegetation Formation and Alliance (Common description)	*Proposed OHV Area (acres)*	*Proposed Motocross Area (acres)*
Lowland or submontane cold-deciduous forest		
Southern red/scarlet oak forest	132.2	0
White oak/mixed oak forest	20.9	0
Southern red/white oak forest	89.2	0
White oak/mixed hickory forest	153.8	0
Deciduous Forest Subtotal	396.1	0
Plantations (planted timber stands)		
Loblolly Pine plantation	285.1	14.4
Cold-deciduous woodland		
E. redcedar/Winged sumac woodland	4.0	0
Post oak/Blackjack oak woodland	5.2	0
Woodland subtotal	9.2	0
Tall sod temperate grassland		
Upland grassland association	9.3	0
Other		
Anthropogenic	0.4	0
Total	**700.1**	**14.4**

Wetland communities (temporarily and seasonally flooded cold-deciduous forests and seasonally flooded grasslands) occupy a very small part of the landscape (less than 1 percent combined). The remaining areas consist of roads and other human-created structures.

Streams and wetlands in the proposed OHV area are described in Section 3.6. These streams and wetlands provide important habitat for a diverse group of amphibians, reptiles, benthic macroinvertebrates, and fish (U.S. Air Force, 2006).

Proposed Motocross Area

Habitat in the proposed motocross area consists entirely of 14.4 acres of former loblolly pine plantation harvested in 2005 and planted with loblolly pine seedlings in 2008.

Sensitive Habitat

Proposed OHV Area

The combination of soils, geology, climate, land use, and other biological factors have created unique ecological conditions at Arnold AFB that are unique in Tennessee and the southeastern United States. At least 17 of the 33 vegetation associations found on Arnold AFB are considered "globally imperiled community types" (i.e., ranked G2-G3 by NatureServe) (U.S. Air Force, 2006). Six of these communities (one woodland, one grassland, and four upland forest types) are present within the proposed OHV area (Figure 3-3 and Table 3-3).

Sensitive communities combined cover more than 57 percent of the proposed OHV area. Other sensitive habitats identified in the area include known rare, threatened, or endangered (RTE) species locations, karst wetlands and streams, and riparian zones (U.S. Air Force, 2006).

The White Oak - Mixed Hickory forests and Southern Red Oak - Scarlet Oak forests are predominant sensitive communities in the proposed OHV area (154 and 132 acres, respectively). The proposed OHV area also includes two additional upland forest communities, one woodland community, and one upland grassland communities, and one wetland grassland community (Table 3-3). In all there are nearly 411 acres of sensitive habitat within the area.

Proposed Motocross Area

There are no sensitive habitats in the proposed motocross area.

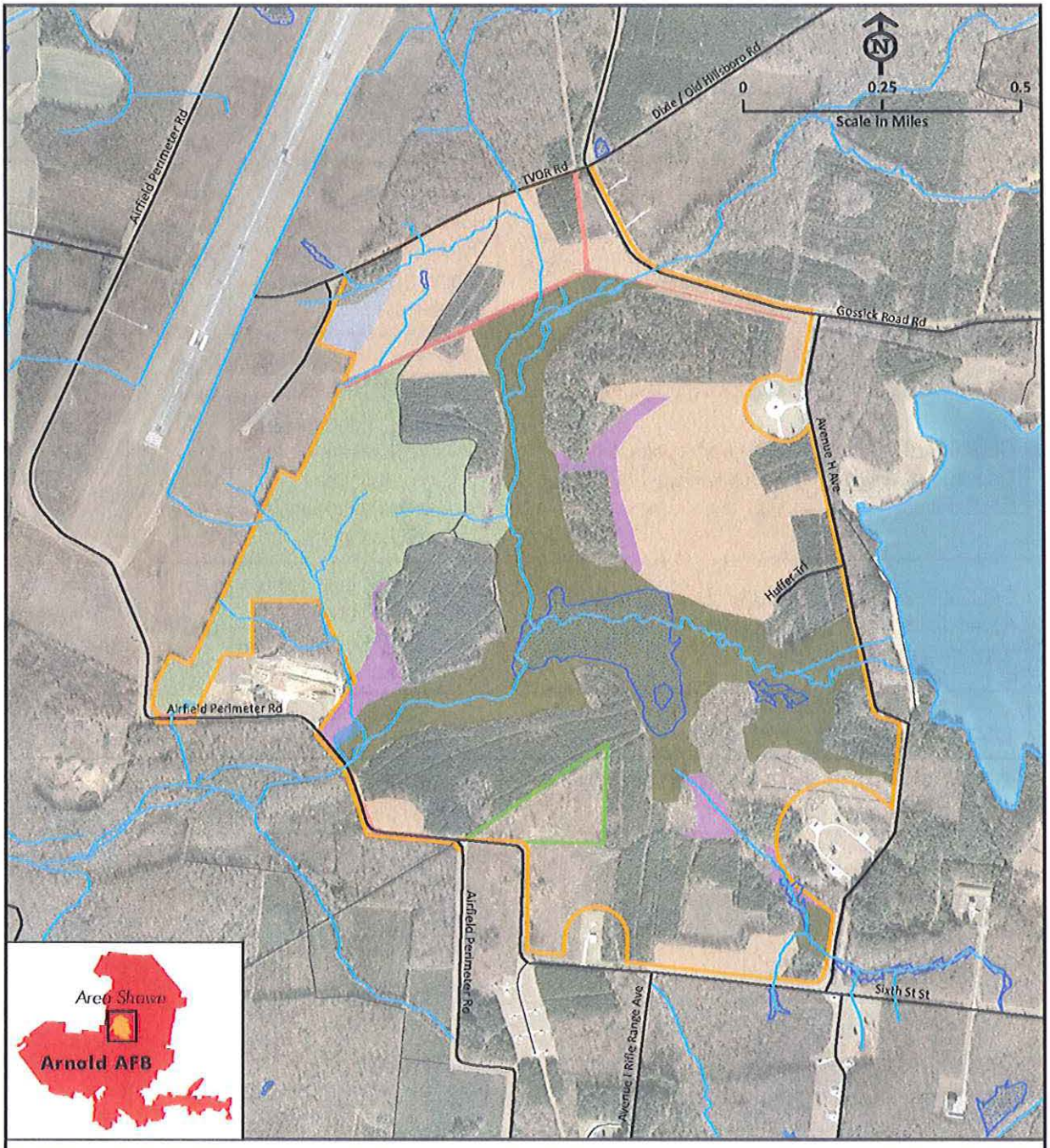

FIGURE 3-3
SENSITIVE HABITATS AT THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

TABLE 3-3
SENSITIVE HABITATS WITHIN THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Scientific Name	*Common Name*	*Global Rank*	*Location and Size (acres)*
Woodland			
CEGL004709 - *Quercus stellata - (Quercus coccinea) / Quercus marilandica / Vaccinium pallidum - (Vaccinium stamineum)* Woodland	Post Oak - (Scarlet Oak) / Blackjack Oak / Hillside Blueberry - (Deerberry) Woodland	G2/G3	OHV Area (5.2)
Forest			
CEGL007709 - *Quercus alba - Carya (alba, ovata) - Liriodendron tulipifera - (Quercus phellos) / Cornus florida* Forest	White Oak - (Mockernut Hickory, Shagbark Hickory) - Tuliptree - (Willow Oak) / Flowering Dogwood Forest	G3/G5	OHV Area (153.8)
CEGL007724 - *Quercus falcata - Quercus alba - (Quercus coccinea) / Oxydendrum arboreum / Vaccinium pallidum* Forest	Southern Red Oak -White Oak - (Scarlet Oak) / Sourwood / Hillside Blueberry Forest	G3	OHV Area (89.2)
CEGL007247 - *Quercus falcata-Quercus coccinea-Quercus (stellata,velutina) / Vaccinium pallidum* Forest	Southern Red Oak- Scarlet Oak (Post Oak, Black Oak)/Hillside Blueberry Forest	G3	OHV Area (132.2)
CEGL007746 - *Quercus alba-Quercus (falcata, stellata) / Chasmanthium laxum* Forest	White Oak-(Southern Red Oak, Post Oak)/Slender Spanglegrass Forest	G3/G5	OHV Area (20.9)
Grassland			
CEGL007705/06/07/08 - *Andropogon gerardii - (Andropogon glomeratus, Panicum virgatum, Sorghastrum nutans) and Schizachyrium scoparium - (Calamagrostis coarctata, Panicum virgatum) and Schizachyrium scoparium - Andropogon (gyrans, ternarius, virginicus)* and *Schizachyrium scoparium*	Upland Grassland Association	G2/G3/ G5	OHV Area (9.3)
Total			**OHV Area (410.6)**

Source: U.S. Air Force, 2006
Global Rank Communities
G2 = imperiled globally
G3 = rare or uncommon
G5 = common
Note: There are no sensitive communities within the proposed motocross area.

Sensitive Species

Proposed OHV Area

Arnold AFB contains an amazing diversity of organisms. The Arnold AFB INRMP (U.S. Air Force, 2006) identifies at least 67 RTE plants and 19 animals on-base. At least five RTE plant species and three RTE animal species (one bird, one fish, and one reptile) are known to occur in or around the proposed OHV area (Figure 3-4 and Table 3-4). None of these species are listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS); however, these species are state listed. Eggert's sunflower was formerly listed as threatened by the USFWS but was delisted due largely in part to conservation efforts and commitments at Arnold AFB.

TABLE 3-4
SENSITIVE SPECIES KNOWN TO OCCUR IN OR NEAR PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Common Name	Scientific Name	Federal Status	State Status	Preferred Habitat
Plants				
American chestnut	*Castanea dentata*	-	S	Oak forests and Woodlands Confirmed: OHV Area
Broad-leaved beardgrass	*Gymnopogon brevifolius*	-	S	Barrens and Grasslands Confirmed: OHV Buffer
Eggert's sunflower	*Helianthus eggertii*	DM	T	Woodlands and grasslands Confirmed: OHV Area
Narrowleaf bushclover	*Lespedeza angustifolia*	-	T	Woodlands and grasslands Confirmed: OHV Area
Canby's lobelia	*Lobelia canbyi*	-	T	Streams, spring, and riparian zones and mesic hardwood forests Confirmed: OHV Buffer
Animals				
Sharp-shinned hawk	*Accipiter striatus*	-	D	Hardwood forests, pine forests, and woodlands Confirmed: OHV Buffer
Flame chub	*Hemitremia flammea*	-	D	Intermittent and perennial streams Confirmed: OHV Area and Buffer
Slender glass lizard	*Ophisaurus attenuatus longicaudus*	-	D	Woodlands, pine forests, and grasslands Confirmed: OHV Buffer

Sources: U.S. Air Force, 2006; TDEC Division of Natural Areas (DNA), 2008; TDEC DNA, 2009.
T = Threatened; D = Deemed in Need of Management; DM = Delisted Taxon; S = Special Concern; OHV = off-highway vehicle

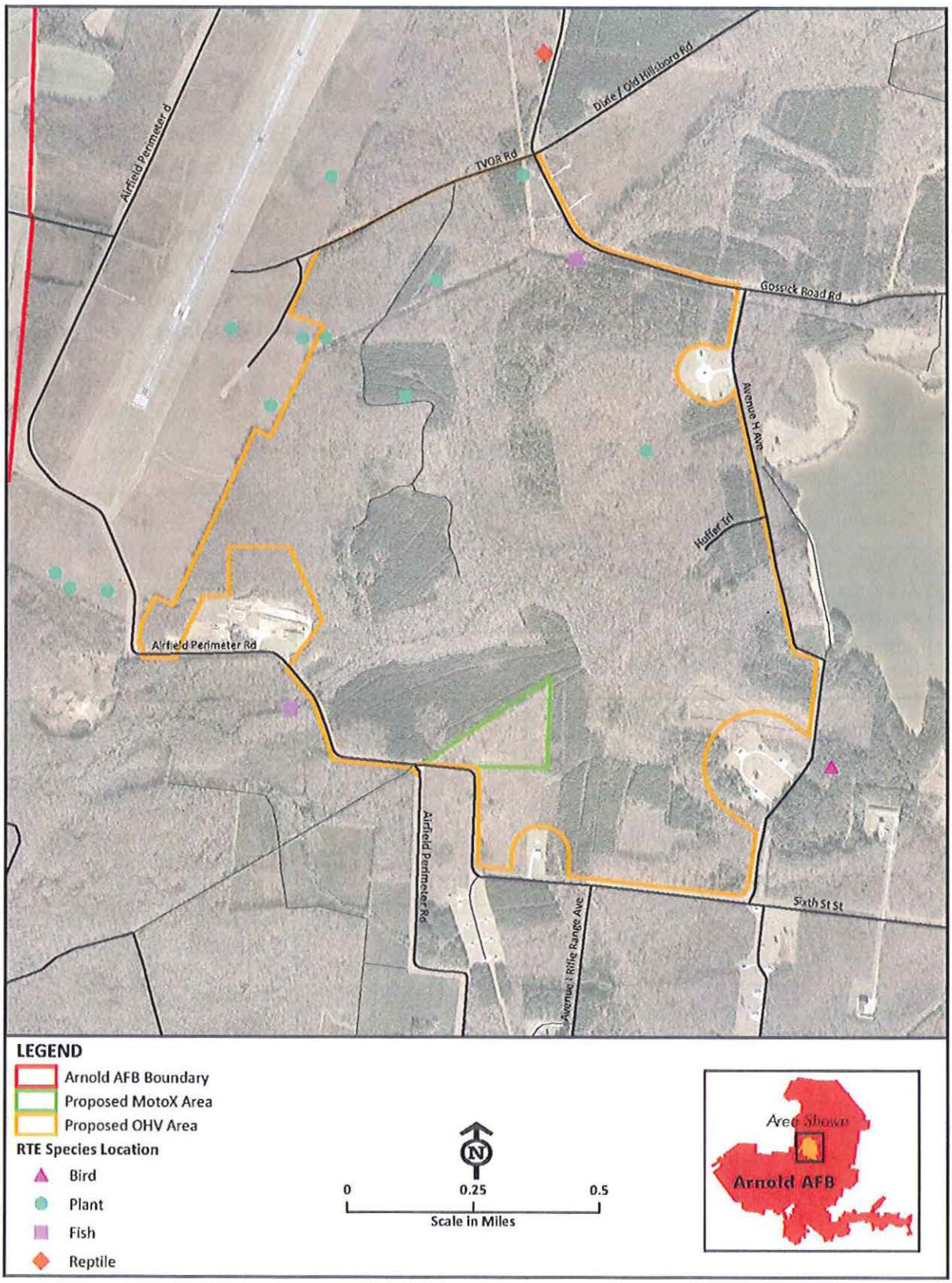

FIGURE 3-4
SENSITIVE SPECIES KNOWN TO OCCUR IN OR NEAR THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

American chestnut (State Special Concern), Eggert's sunflower (State Threatened), and narrowleaf bushyclover (State Threatened) have been recorded within the proposed OHV area. Broad-leaved beardgrass (State Special Concern) and Canby's lobelia (State Threatened) have been recorded very close to the proposed OHV area (within 0.25 mile), and suitable habitat for them exists within the proposed area.

Flame chub (State Deemed in Need of Management), has been captured in Crumpton Creek within the proposed OHV area and immediately downstream from the area. Sharp-shinned hawk and slender glass lizard (both State Deemed in Need of Management) have been recorded within 0.25 mile of the proposed OHV area, and suitable habitat for them exists throughout the proposed area.

Proposed Motocross Area

There are no records of any rare plants or animals from the proposed motocross area. However, there are records of Eggert's sunflower from three locations within the proposed OHV area. All of these records occur along the edges of pine plantations similar to those in the proposed motocross area, so potentially suitable habitat could occur in the proposed motocross area. Potentially suitable habitat for sharp-shinned hawk and slender glass lizard exists in this area.

Invasive Species

Invasive plants and animals are a threat to both sensitive habitats and sensitive species. Many invasive plants and animals have been identified at numerous locations within the proposed OHV area. Threats associated with invasive pest plant (IPP) species at Arnold AFB have received increasing attention since the initiation of ecosystem management on the installation in 1995 (U.S. Air Force, 2005a). Since 1999, land managers at Arnold AFB have undertaken various interventions designed to control and reduce the occurrence of invasive plants (U.S. Air Force, 2005a). A combination of prevention, manual and mechanical control, chemical control, biological control, and prescribed burning have been used successfully to address IPP problems at the base. Each year a combination of these treatments are employed to combat IPP species in priority areas of the base.

In the 1960s and 1970s, IPPs such as bicolor lespedeza and autumn olive were routinely planted to provide food and cover for wildlife; however, IPP species have not been planted at Arnold AFB for many years. The *Arnold AFB Integrated Pest Management Plan* was approved and initiated in 2003 with the purpose of controlling IPP species on the base. Table 3-5 contains a list of invasive plants and animals identified at Arnold AFB. It should be noted that pines are considered a priority IPP species at Arnold. Although several pine species are native to much of Tennessee, all pines at the base have been introduced for landscaping or forest management purposes. There are many existing pine plantations at the base, including the proposed OHV area and the proposed motocross area. Many of these pine plantations are converted to barren habitat

following harvest or allowed to regenerate into native hardwood or mixed hardwood-pine communities. However, following harvest many plantations are replanted with pine to achieve various forest management goals.

TABLE 3-5
PRIORITY INVASIVE PEST PLANT SPECIES KNOWN ON ARNOLD AFB, TN
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Scientific Name	*Common Name*	*Arnold AFB Rank **	*TN-EPPC Rank***
Ailanthus altissima	Tree of heaven	Very High	Severe threat
Broussonetia papyrifera	Paper mulberry	Very High	Lesser threat
Paulownia tomentosa	Princess tree	Very High	Severe threat
Populus alba	White poplar	Very High	Significant
Pueraria montana	Kudzu	Very High	Severe threat
Albizia julibrissin	Mimosa	High	Severe threat
Lespedeza cuneata	Sericea lespedeza	High	Severe threat
Ligustrum sinense	Chinese privet	High	Severe threat
Ligustrum vulgare	Common privet	High	Severe threat
Rosa multiflora	Multiflora rose	High	Severe threat
Sorghum halapense	Johnsongrass	High	Severe threat
Vinca minor	Periwinkle	High	Significant threat
Wisteria sinensis	Wisteria	High	Alert
Pinus spp.	Pine spp.	High	Not on list
Poncirus trifoliata	Trifoliate orange	High	Not on list
Alliaria petiolata	Garlic mustard	Medium	Significant threat
Elaeagnus umbellata	Autumn olive	Medium	Severe threat
Coronilla varia	Crown vetch	Medium	Alert
Lespedeza bicolor	Bicolor lespedeza	Medium	Severe threat
Arthraxon hispidus	Hairy jointgrass	Low	Significant threat
Festuca arundinacea	Fescue	Low	Significant threat
Lonicera japonica	Japanese honeysuckle	Low	Severe threat
Microstegium vimineum	Japan grass	Low	Severe threat
Carduus nutans	Musk thistle	Not Rankable	Significant threat
Verbascum thapsus	Common mullein	Not Rankable	Significant threat
Celastrus orbiculatus	Oriental bittersweet	Did not rank	Severe threat

*Arnold AFB Rank (U.S. Air Force, 2005a; U.S. Air Force, 2006)
** Tennessee Exotic Pest Plant Council (TN-EPPC) Rank (TN-EPPC, 2009)

3.4 Cultural Resources

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons. As defined under 36 CFR 800.16 (l)(1), "[an] Historic Property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related and located within such properties. The term includes properties of traditional religious and cultural

importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

Arnold AFB is required to comply with a wide range of federal laws, regulations, and EOs. Both DoD Instruction 4715.3, *Environmental Conservation Program*, and AFI 32-7065, *Cultural Resources Management Program*, outline proper procedures for cultural resources management at Air Force facilities. The analysis methodology for cultural resources is guided in part by the various definitions of cultural resources laws, regulations, and guidance.

The analysis of cultural resources is mandated or guided by a host of federal laws, rules, and regulations. Foremost among cultural resources compliance laws is the National Historic Preservation Act (NHPA) of 1966, as amended. Under NHPA, the Air Force is required to consider the effects of its undertakings on historic properties listed or eligible for listing in the National Register of Historic Places (National Register), and to consult with interested parties regarding potential impacts. The National Register, authorized under the NHPA of 1966, is the United States' formal listing of cultural resources considered worthy of preservation. The National Register is administered by the National Park Service and is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

In addition to NHPA and NEPA, other laws are also pertinent or potentially pertinent to cultural resources and the Proposed Action. Among these are the Antiquities Act of 1906, the Historic Sites Act of 1935, the Archaeological and Historic Preservation Act of 1974, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation and Protection Act of 1990, and the American Indian Religious Freedom Act of 1978, 36 CFR 800, *Protection of Historic Properties* (incorporating amendments effective 05 August 2004); 36 CFR 63, *Determinations of Eligibility for Inclusion in the National Register*; EO 11593, *Protection and Enhancement of the Cultural Environment*; EO 13007, *Indian Sacred Sites*; and EO 13287, *Preserve America*.

For the purpose of this EA, cultural resources, with a description of their state of investigation and condition, are presented for analysis as they intersect with the Area of Potential Effects (APE) (the cultural resources term for NHPA terminology equivalent to region of influence, or "ROI") created by the undertaking (as it is presented in the existing conditions descriptions respective to each Alternative). As defined under 36 CFR 800.16(d), "the Area of Potential Effects is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The area of potential effects is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking." The APE for this project is assumed not to extend

beyond the footprint of the project boundaries. Should additional consultation with the State Historic Preservation Officer (SHPO)/other parties at any of the facilities determine that modification to the APE is required, the analysis would be adjusted accordingly.

The analysis of potential environmental consequences focuses on (a) what cultural resources fall within the APE; (b) whether additional efforts to identify or evaluate cultural resources need to be conducted within the APE, as determined by the Air Force, in consultation with the SHPO and other appropriate parties; and (c) what mitigations would be required or appropriate to these resources if adverse effects (i.e., impacts) were expected to occur.

Several organizations are involved as consulting parties regarding cultural resources at Arnold AFB. These include, but are not limited to, the Alabama-Coushatta Tribe of Texas; Alabama Quassarte Tribal Town; Chickasaw Nation of Oklahoma; Choctaw Nation of Oklahoma; Eastern Band of Cherokee Indians; Kialegee Tribal Town; Muscogee (Creek) Nation of Oklahoma; Poarch Creek Indians; Shawnee Tribe; Thopthlocco Tribal Town; United Keetowah Band of Cherokee; Absentee Shawnee Tribe of Oklahoma; Cherokee Nation of Oklahoma; Jena Band of Choctaw Indians; Seminole Nation of Oklahoma; and the Tennessee SHPO. Arnold AFB currently has Memoranda of Understanding signed with the tribal groups establishing government-to-government relations and detailing issues of consultation and cooperation. In addition, Arnold AFB has signed a programmatic agreement concerning management of historic properties with the Tennessee SHPO (U.S. Air Force, 2007d).

The APE for cultural resources for the Proposed Action is depicted in Figure 3-5, which consists of the entire proposed OHV riding area. This entire area was previously surveyed for cultural resources (McWhite, 2009).

Identified cultural resources within this area consist of one potentially eligible archaeological site (40CF287), two archaeological sites under review for eligibility, and two identified historic cemeteries (Chapel Hill and Huffar cemeteries). Site 40CF287 is an early twentieth century homestead that was active in 1938; it consists of a house foundation, well, and various refuse (U.S. Air Force, 2007d). In addition, an American Indian Reinterment Site is being established at Arnold AFB in consultation with interested American Indian Nations, Tribes, and Tribal Towns. The site's creation is a proactive step in the process of mitigating the outcome of ground-disturbing activities that have the potential to produce inadvertent finds of culturally sensitive material, including human remains. With a designated location for the reinterment of any identified sensitive remains, the timetable when such culturally sensitive material remains unburied is minimized. No historic structures considered eligible for the National Register are located within the OHV area. In addition, there are no identified historic districts or traditional cultural properties present within this area.

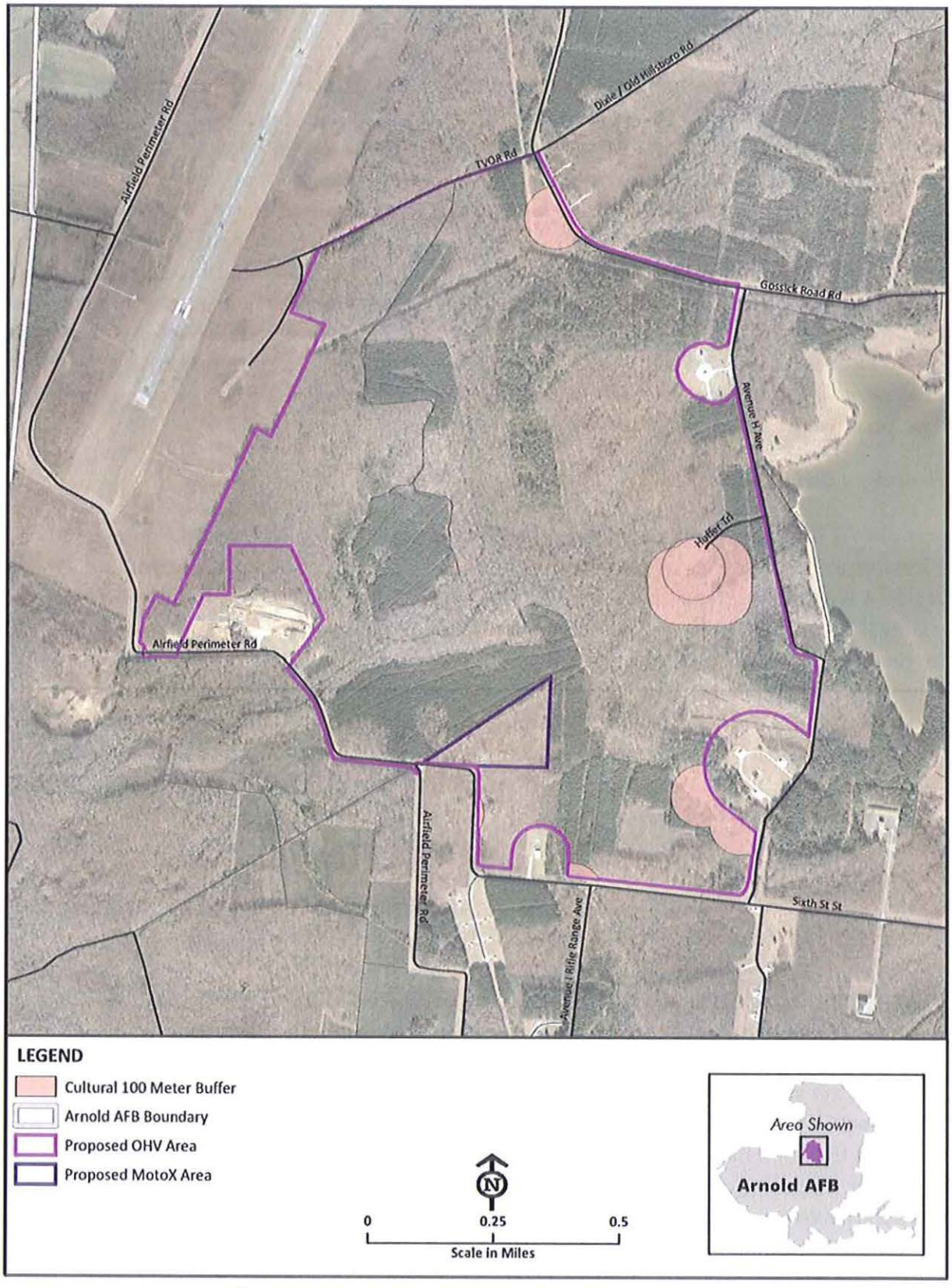

FIGURE 3-5
CULTURAL RESOURCE AREAS IN THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

3.5 Geomorphology and Soils

This section presents information on general geomorphology, soil environment, and soil erosion potential within the area that could potentially be impacted by the proposed OHV area, which includes a proposed motocross area. *Geomorphology* refers to local landforms and how they may affect or be affected by the Proposed Action. *Soils* refers to unconsolidated materials formed from the underlying bedrock or derived from other parent material(s). Characteristics of soils such as drainage, texture, strength, depth to water table, water capacity, and erodibility all determine the suitability of the ground to support man-made activities and facilities. Depending upon their properties and the topography upon which they occur, soils have varying susceptibility to erosion. Soil disturbances associated with OHV activities or development may potentially result in erosion and the transport of eroded materials into drainages and other water bodies. The proposed OHV area is largely undeveloped.

Proposed OHV Area

Arnold AFB is located in the eastern portion of the Highland Rim and Pennyroyal Physiographic Province as defined by the U.S. Department of Agriculture (USDA, 2006), a regional plateau characterized by low rolling hills, upland flats, and narrow valleys. Elevations in the region range from 800 to 1,300 feet. Soils in the region tend to be deep to moderately deep, generally moderately well drained or well drained, and loamy or clayey. The major soil resource concern in the Highland Rim and Pennyroyal Physiographic Province is water erosion, which is considered a hazard on cropland, streambanks, and construction sites. Additional resource concerns in the area are the maintenance of organic matter content and soil productivity and management of soil moisture (USDA, 2006).

The most recent soil survey for Arnold AFB was completed in September 2000 and serves as an update to previous NRCS soil surveys conducted for Coffee and Franklin Counties in 1956 and 1949, respectively (U.S. Air Force, 2006).

In general, the parent material of soils in the proposed OHV area is loess (silt-sized material transported and deposited by wind) overlying older alluvium (material deposited by streams and rivers) (U.S. Air Force, 2006). Rounded pebbles commonly found in the subsoil layers were deposited by an ancient river. Soils found in the proposed OHV area are predominantly silt loams, with small areas of gravelly silt loam. Many of the soils have continuous or discontinuous fragipan—a relatively impermeable soil layer that restricts water flow and root penetration. Fragipan on Arnold AFB contributes to seasonal flooding patterns on the base by restricting drainage during the winter and limiting upward water movement during the summer (U.S. Air Force, 2006). Most soils in the proposed OHV area are extremely to slightly acidic, with pH levels ranging from 3.6 to 6.5. Topography for much of the proposed OHV area is flat, with slopes of 0 to 2 percent with isolated areas of moderate slope (up to 15 percent).

Figure 3-6 shows the soil types present in the proposed OHV area. Table 3-6 lists soil types by acreage in the proposed OHV area. Descriptions of individual soil series found in the proposed OHV area follow the table (USDA, 2001; U.S. Air Force, 2006; Arnold AFB, 2010).

TABLE 3-6
SOIL TYPE BY ACREAGE IN THE PROPOSED OHV AREA (EXCLUDING MOTOCROSS)
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Soil Type	*Acres*
Dickson Silt Loam 0–2% Slope	166.7
Dickson Silt Loam 2–7% Slope	179.1
Guthrie Silt Loam 0–2% Slope	9.0
Lawrence Silt Loam 0–2% Slope	69.2
Lobelville Silt Loam 0–2% Slope	121.6
Mountview Silt Loam 0–2% Slope	3.1
Mountview Gravelly Silt Loam 7–15% Slope	25.4
Purdy Silt Loam 0–2% Slope	140.7
Total	714.5

The Dickson soil series consists of very deep, moderately well drained soils that have a slowly permeable fragipan in the subsoil, located 20 to 30 inches below the surface. The soils are found on nearly level to sloping uplands and formed in a silty mantle 2 to 4 feet thick and in the underlying residue of limestone. Local high water elevation is 2 to 3 feet from the surface, and the soils have moderate water capacity and slow to moderately slow permeability. Soils in this series are not prone to flooding. Slopes in the proposed OHV area range from 0 to 7 percent; Dickson soils with greater than 2 percent slope have a moderate erosion potential.

The Guthrie series consists of very deep, poorly drained soils with a discontinuous fragipan found in the lower subsoil. Soils have moderate permeability above the fragipan and slow to very slow permeability in the fragipan. Guthrie soils formed in silty material on upland flats, depressions, and drainage ways. Local high water elevation is 0.5 to 1 foot below the surface, and the soils have moderate water capacity. Some areas of Guthrie series soils can be ponded for several weeks during the winter and spring. Soils of the Guthrie series have a slight erosion potential and can be among the most acidic in the proposed OHV area, with pH levels ranging from 3.6 to 5.5.

The Lawrence series consists of very deep, somewhat poorly drained soils with a fragipan found in the subsoil. The soils in this series formed in a silty mantle of loess or alluvium, colluvium, or in the underlying residue of limestone and is found on nearly level stream terraces, alluvial fans, and on nearly level uplands. Local high water elevation is 1 to 2 feet below the surface, and the soils have moderate water capacity. Permeability of Lawrence soils is moderate above the fragipan and slow or very slow below it; soils can commonly flood for very brief or brief periods. Lawrence series soils have a slight erosion potential.

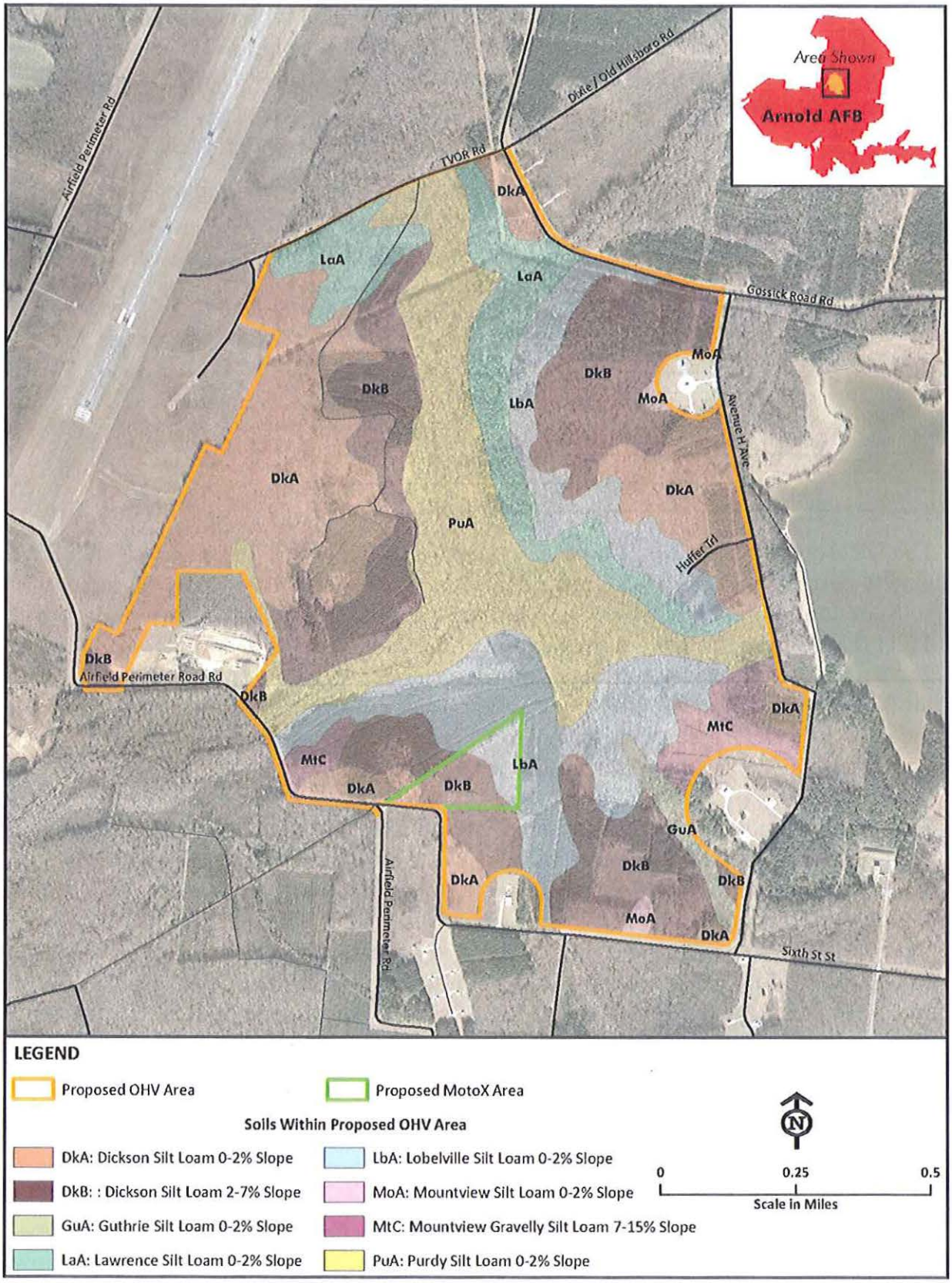

FIGURE 3-6
SOILS IN THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

The Lobelville series consists of very deep, moderately well drained soils found on floodplains and foot slopes. The soils formed in approximately 2.5 to 3.5 feet of loamy alluvium and in the underlying highly gravelly alluvium. Local high water elevation is 2 to 3 feet below the surface. Lobelville soils have moderate permeability, high water capacity, and can occasionally or frequently flood for very brief or brief periods. Lobelville series soils have a slight erosion potential.

The Mountview series consists of very deep, well drained and moderately well drained soils that formed in 2 to 3 feet of a silty mantle and in the underlying residue of limestone or old alluvium. Local high water elevation is found at a depth greater than 6 feet below the surface. Mountview soils have moderate to moderately slow permeability and high water capacity, but are not prone to flooding. Soils of 0 to 2 percent slope have slight erosion potential; soils with slopes ranging from 7 to 15 percent have moderate erosion potential.

The Purdy series consists of very deep, poorly drained or very poorly drained soils formed in slackwater-deposited alluvial materials and are found on nearly level to gently sloping terraces. Local high water elevation is approximately 1 foot below the surface. Purdy soils have slow or very slow permeability, high water capacity, and frequently flood for long periods. Purdy soils have slight erosion potential. Along with the Guthrie, soils of this series can be among the most acidic in the proposed OHV area, with pH levels ranging from 3.6 to 5.5.

Proposed Motocross Area

General conditions in the proposed motocross area are the same as those described above. Soil series located in the 14.4-acre proposed site are the Dickson and Lobelville, both moderately well drained soils with slow permeability (Figure 3-6). Depth to the local water table for both soils is approximately 2 to 3 feet. Dickson soils with greater that 2 percent slope have a moderate erosion potential. Lobelville soils can commonly flood for brief periods during wet seasons. Table 3-7 lists soil type by acreage in the proposed motocross area.

TABLE 3-7
SOIL TYPE BY ACREAGE IN THE PROPOSED MOTOCROSS AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Soil Type	*Acres*
Dickson Silt Loam 0–2% Slope	1.0
Dickson Silt Loam 2–7% Slope	7.5
Lobelville Silt Loam 0–2% Slope	5.9
Total	**14.4**

3.6 Water Quality and Hydrology

Surface water resources include lakes, rivers, and streams and are important for a variety of reasons, including irrigation, power generation, recreation, flood control, and human health. Under the CWA, it is illegal to discharge pollutants from a point source into any surface water without a National Pollutant Discharge Elimination System (NPDES) permit. Under the CWA, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or if appropriate, from the interstate water pollution control agency with jurisdiction over the affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with the CWA. The U.S. Environmental Protection Agency (USEPA) has the authority to set standards for the quality of wastewater discharges. The State of Tennessee has legal authority to implement and enforce the provisions of the CWA, while the USEPA retains oversight responsibilities.

At the Tennessee state level, water resources are afforded regulatory protection under the Tennessee Department of Environment and Conservation (TDEC) in accordance with the state's stormwater management program and the Tennessee Aquatic Resources Alteration Permit program. Potential impacts to surface waters may result if the Proposed Action triggers permitting requirements under the Section 401 Certification program (40 CFR 230.10(b)). Erosion and sedimentation control regulations were established for controlling erosion and sedimentation from land-disturbing activities, requiring that permits be obtained for land-disturbing activities. Permit applicants must submit an erosion and sedimentation control plan that incorporates specific conservation and engineering practices or mitigations. The permitting process includes special requirements for land-disturbing activities in stream buffer zones. Land-disturbing activities are not allowed within 25 feet of any state waters unless a variance is granted by TDEC for drainage structures.

The TDEC Division of Water Pollution Control is responsible for administration of the Tennessee Water Quality Control Act of 1977 (Tennessee Code Annotated [TCA] 69-3-101). On an annual basis, the Division monitors, analyzes, and reports on the quality of Tennessee's water. TDEC uses a watershed approach under the concept that many water quality problems, such as the accumulation of pollutants or nonpoint source pollution, are best managed at the watershed level.

Arnold AFB is roughly divided in half from the northeast to the southwest by the Upper Duck River and Upper Elk River watersheds. The Upper Duck River Watershed, located in middle Tennessee, drains approximately 1,182 square miles and empties into

the Lower Duck River Watershed. Notable water bodies in the watershed include the Duck River and Normandy Lake (TDEC, 2003). The watershed contains 23 impacted water body segments on the most recent state 303(d) list (TDEC, 2008). The Upper Elk River Watershed, located in middle southern Tennessee, drains approximately 1,277 miles and empties into the Lower Elk River Watershed. Notable water bodies in the watershed include the Elk River, Tims Ford and Woods Reservoirs (TDEC, 2005). The watershed contains 22 impacted water body segments in the most recent state 303(d) list (TDEC, 2008).

Two notable water bodies are located within the base boundary: Retention Reservoir and Woods Reservoir. Woods Reservoir, a 3,632-acre impoundment located in the southern portion of the base, provides cooling water for test facilities as well as water for air conditioning, fire protection, and potable water. The reservoir also provides recreational activities for base personnel and the surrounding communities (U.S. Air Force, 2006). The man-made 175-acre Retention Reservoir, just to the east of the proposed OHV area, receives cooling water and drainage from the AEDC complex and drains to Rowland Creek (AEDC, 2001).

Proposed OHV Area

The proposed OHV area is contained in the Upper Duck River Watershed, but is bordered to the east by the Upper Elk River Watershed. Crumpton Creek, the prominent water course flowing through the area, runs generally north-south through the proposed OHV area and merges with Wiley Branch upstream from Rutledge Falls before discharging into Normandy Lake, approximately 4 miles to the northwest. Within the proposed OHV area, there are also numerous small, ephemeral or intermittent streams, many of which are tributaries of Crumpton Creek. Figure 3-7 shows water resources within the proposed OHV area.

There are no 303(d) segments found within the proposed OHV area (TDEC, 2008). Figure 3-3, found in Section 3.3, *Biological Resources*, shows the location of the Retention Reservoir and streams within the proposed OHV area.

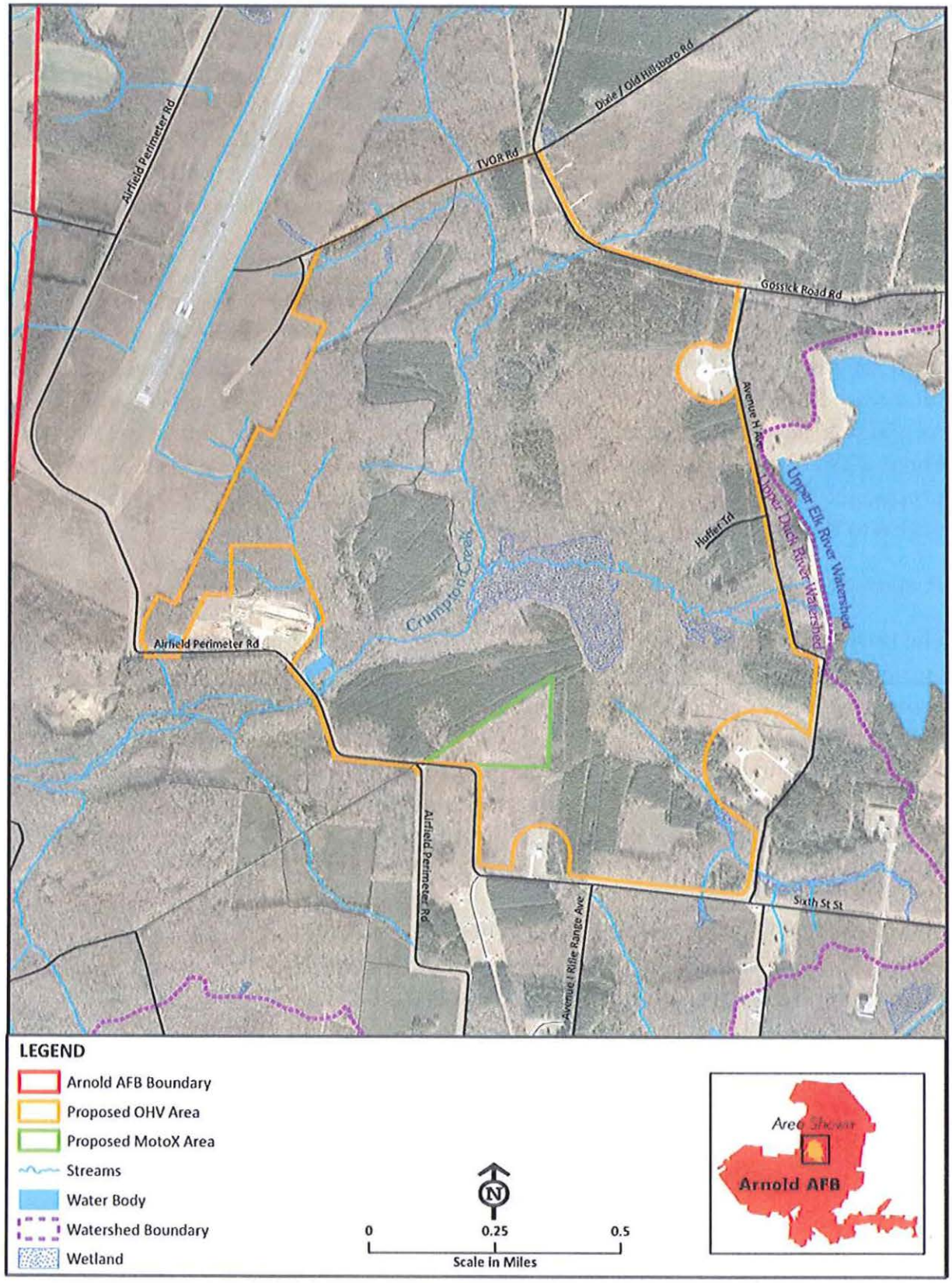

FIGURE 3-7
WATER RESOURCES IN THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) and USEPA 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 for life in saturated soil conditions." Section 404 of the CWA established a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands.

The USACE, the lead agency in protecting wetland resources, maintains jurisdiction over federal wetlands (33 CFR 328.3) under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. In addition, EO 11990, *Protection of Wetlands*, requires federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. EO 11990 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

There are a total of 1,894 acres of wetlands on Arnold AFB, varying in size from 0.05 acre to 267 acres, the majority of which occur in the northern portion of the base. Prominent on-base wetlands include Sinking Pond, Westall Swamp, Willow Oak Swamp, Tupelo Swamp, and Goose Pond (U.S. Air Force, 2006). Within the proposed OHV area, there are approximately 31 acres of wetlands, the largest of which (21.6 acres) is located just south of the center of the proposed OHV area. A smaller wetland of approximately 3.7 acres is just to the east, and several smaller wetlands can be found in the northern and southern portions of the proposed OHV area. Figure 3-7 shows the location of these wetlands.

Floodplains are defined by EO 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, including at a minimum, the area subject to a 1 percent or greater chance of flooding in any given year" (that area inundated by a hundred-year flood). EO 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. No floodplains are located within the proposed OHV area, including the proposed motocross area.

Proposed Motocross Area

Regional and base-wide conditions in the proposed motocross area are the same as those described above. No streams are located within the proposed motocross area; the nearest streams are Crumpton Creek, located approximately 1,000 feet to the northwest

and a small ephemeral stream, approximately 500 feet to the west. No wetlands are found within the proposed motocross area, but the largest wetland (21.6 acres) in the proposed OHV is located approximately 200 feet northeast of the proposed motocross area.

3.7 Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of part per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The ROI used for air quality analysis centers on the county in which the action would take place.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Further discussion of the NAAQS and each of the state's air quality standards are included in Appendix B.

Based on measured ambient air pollutant concentrations, the USEPA designates whether areas of the United States are meeting the NAAQS or not. Those areas demonstrating compliance with the NAAQS are considered "attainment" areas, while those that are not area known as "nonattainment." Those areas that cannot be classified on the basis of available information for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise.

Arnold AFB is located in both Coffee and Franklin Counties. The Proposed Action and alternatives would take place only in Coffee County, which is used as the ROI.

For the analysis of the alternatives, a threshold on an individual pollutant-by-pollutant basis was established. The pollutants analyzed are the criteria pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM), sulfur dioxide (SO_2), and volatile organic compounds (VOCs).

County emissions were obtained from the USEPA's 2002 National Emissions Inventory (NEI). This data include emissions data from point sources, area sources, and mobile sources. *Point sources* are stationary sources that can be identified by name and location. *Area sources* are point sources whose emissions are too small to track individually, such as a home or small office building or a diffuse stationary source, such as wildfires or agricultural tilling. *Mobile sources* are any kind of vehicle or equipment with a gasoline or diesel engine, an airplane, or a ship. On-road and non-road are two types of mobile sources. On-road consists of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Non-road sources are aircraft, locomotives, diesel and

gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2006).

Arnold AFB is located in the Tennessee River Valley (Alabama)-Cumberland Mountains (Tennessee) Interstate Air Quality Control Region (AQCR). This analysis uses a ROI of Coffee County, which is in attainment for all criteria pollutants. The General Conformity Rule requires an action's air emissions impacts to be compared to the AQCR; for a conservative approach, only the county in which the action is occurring is used for the ROI. Baseline emissions for the ROI county are presented in Table 3-8.

TABLE 3-8
BASELINE EMISSIONS FOR COFFEE COUNTY, TENNESSEE
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Source Type	Coffee County Emissions Tons/yr				
	CO	NO_x	PM_{10}	SO_x	VOC
Area Sources	1,042	208	3,982	449	1,239
Non-Road Mobile	4,534	565	45	56	452
On-Road Mobile	24,374	5,426	102	129	1,774
Point Sources	143	151	39	81	938
Total	**30,093**	**6,350**	**4,169**	**716**	**4,403**

Source: USEPA, 2002

Air pollutants are emitted from stationary and mobile source and general maintenance activities, government and privately owned vehicles, jet engine testing, aircraft operations, prescribed burning, wildfires, and mission test and training operations (U.S. Air Force, 2005b). In May 2002 the Tennessee Air Pollution Control Board of the TDEC issued a Title V Operating Permit. This permit covers 26 emission sources currently in compliance (U.S. Air Force, 2005b).

3.8 Noise

Within the context of this EA, noise effects are focused on potential impacts to wildlife, since the users of the OHV area would be willingly exposing themselves to excessive noise from OHV operations. Noise is defined as any unwanted sound. Defining characteristics of noise include sound level (amplitude), frequency (pitch), and duration. Each of these characteristics plays a role in determining a noise's intrusiveness and level of impact on a noise receptor. The term "noise receptor" is used in this document to mean any person, animal, or object that hears or is affected by noise.

Sound levels are recorded on a logarithmic decibel scale, reflecting the relative way in which the ear perceives differences in sound energy levels. A sound level that is 10 decibels (dB) higher than another would normally be perceived as twice as loud while a sound level that is 20 dB higher than another would be perceived as four times as loud.

Typically, sound levels at any given location change constantly. For example, the sound level changes continuously when a vehicle moves by, starting at the ambient (background) level, increasing to a maximum when the vehicle passes closest to the receptor, and then decreasing to ambient levels when the vehicle moves into the distance. The term "Maximum Sound Level," or Lmax," represents the sound level at the instant during a vehicle passing when sound is at its maximum.

Effects of Noise

Annoyance is the most common effect of noise on wildlife. Within the context of this Proposed Action, excessive noise may contribute to annoyance and interfere with activities such as foraging, sleeping, and potentially breeding for wildlife. Whether or not a receptor becomes annoyed by a particular noise is highly dependent on situational variables of the receptor as well as the physical properties of the noise (Federal Aviation Administration [FAA], 1985). However, when assessed over long periods of time and with large groups of receptors, a strong correlation exists between the percentage of receptors highly annoyed by noise and the time-averaged noise exposure level in an area (Schultz, 1978; Finegold et al., 1994).

Noise affects wildlife differently from humans, and the effects of noise on wildlife vary from serious to nonexistent in different species and situations. Vehicle noise can interfere with animal communication essential for reproduction. Risk of hearing damage in wildlife is probably greater from exposure to nearby impulsive noise rather than from long-lasting exposure to continuous noise. Behavioral effects that might decrease chances of surviving and reproducing include retreat from favorable habitat near noise sources and reduction of time spent feeding, resulting in energy depletion. Serious effects such as decreased reproductive success have been documented in some studies and documented to be lacking in other studies. Decreased responsiveness after repeated noises is frequently observed and usually attributed to habituation; however, this varies by species and noise type.

Existing Condition

The existing noise environment at the proposed location generally consists of ambient, natural noise, with the occasional low-level impulsive noise from nearby Tennessee Army National Guard training and AEDC testing activities. Noise is also occasionally generated by vehicles and equipment in the area conducting forestry activities.

4.0 Environmental Consequences

4.1 Land Use

4.1.1 No Action

Impacts to land use are not expected under the No Action Alternative. Activities at Arnold AFB would continue to be conducted according to objectives of Arnold AFB land use plans, policies, and LUCs.

4.1.2 Proposed Action

Existing Recreation – The current "recreational" land use designation of proposed OHV areas would continue under the Proposed Action. The OHV area would remain as a Class IV Recreational Area, which includes recreation areas that are not open to the general public. Access to this area would be limited to Arnold AFB affiliated users and would be closely managed by the 704 Civil Engineering Squadron, Asset Management (704 CES/CEA). Potential conflicts between hunters and OHV riders associated with concurrent use of the area would be resolved through closure of the OHV trail system during specified hunting periods. Periods of closure over and above those identified previously in Chapter 2 would be determined as part of the overall OHV program development process. Use of the area for hunting may be impacted due to any restrictions/closures of the area for hunting because of OHV use.

IRP Sites – Arnold IRP Program personnel indicate that there would be no impacts to WP-12 from OHVs, provided that trails utilized existing firebreaks/forestry roads in this area. As a result, the boundary for site WP-12 is identified as an avoidance area; minimal ground disturbance for trail preparation would be required in this area. Ground disturbance in site SD-14 should be minimized to the extent practicable. There would also be no adverse impacts with establishing a trail through areas associated with SS-17, which is located southeast of the runway. There are existing LUCs implemented for this site that preclude the use of underlying groundwater due to the potential presence of the chemical perchlorate; however, no LUCs associated with this site relate to soil disturbance that would be expected from proposed OHV trail development or usage activities (Flatt, 2010). Consequently, the Proposed Action would have no adverse impacts on existing IRP sites, provided that trail development avoided areas identified as red in Figure 4-1.

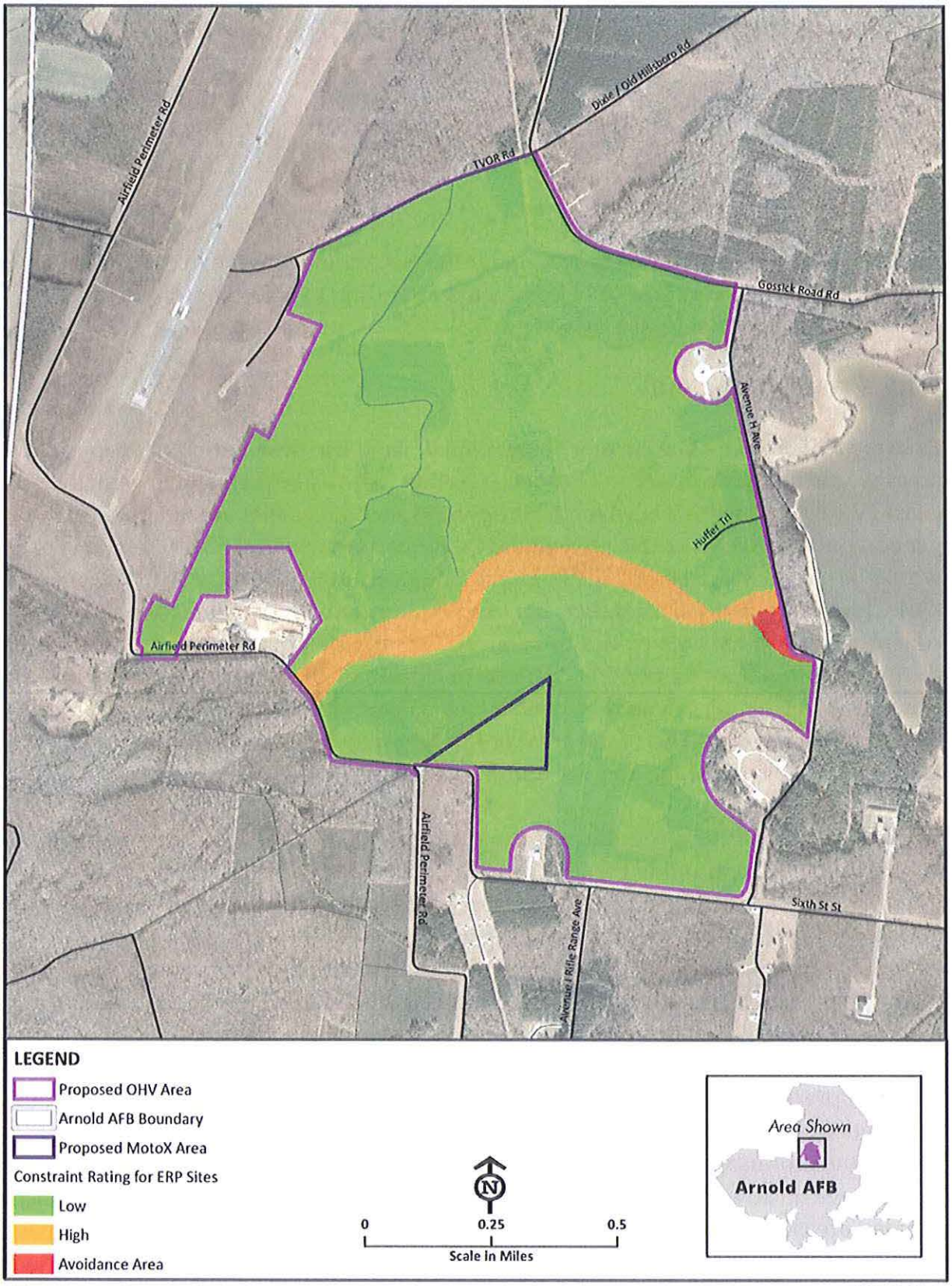

FIGURE 4-1
LOCATION OF IRP CONSTRAINT AREAS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

4.1.3 Alternative 1: Motocross Area Only

Under this alternative, the environmental consequences associated with land use for the development, maintenance, and use of the motocross course would be the same as those described in Proposed Action. As such, no adverse impacts would occur.

4.1.4 BMPs and Management Actions for Land Use

Trail development in site WP-12 must utilize existing firebreaks/forestry roadways.

Closure of the OHV trail system during hunting seasons would minimize any potential adverse land use conflicts with other recreational users and would also serve to minimize any potential safety issues associated with hunters utilizing the area while OHV riders are present. The trail system would be shut down during gun season. Additional closures to consider would be closing the trail system from dawn to noon on weekends during spring turkey season, as well as limiting archery hunting outside of gun season.

4.2 Safety

4.2.1 No Action

Impacts to safety and occupational health are not expected under the No Action Alternative. Activities at Arnold AFB would continue to be conducted according to U.S. Air Force regulations and technical orders, AFOSH standards, and OSHA standards.

4.2.2 Proposed Action

To support the proposed alternatives, Arnold AFB would establish and maintain an OHV trail system. The installation would utilize existing roads and fire breaks to the greatest extent possible; however, construction may be required for new sections of the system. Routine maintenance would also be required to ensure safe riding conditions and to mitigate potential environmental impacts.

Construction may comprise tree and brush clearing, grading of the road surface, and addition and compaction of gravel or fill. Maintenance of the OHV area may include trail clearing, such as removal of hazardous debris such as fallen trees or limbs, and repairs to such as grading and graveling to fix rutted areas. For the motocross area, maintenance would consist of grading jump and curve slopes, removal of hazardous debris, and repair of any environmental degradation. In most cases the nature of OHV

maintenance activities would be low-impact, consisting of manual labor to remove trees and other debris (chain saws for trees and limbs); however, vegetation clearing may require machinery, depending on the type of vegetation removed (a mower/bush hog for tall grasses). For the motocross area, a grader or possibly a Bobcat would need to be used for grading or repairing the jump and curve slopes, while a bush hog or mower could be needed for vegetation control.

No unique construction practices or materials are required to develop or maintain the OHV trail system. During construction, standard industrial safety standards and best management practices (BMPs) would be followed. These would include implementing procedures to ensure that PPE are used; conducting employee safety orientations and performing regular safety inspections; and developing a plan of action for the correction of any identified hazards. No unusual safety risks are expected from these activities.

The use of OHVs also poses a risk for serious injury or death. Accidents may occur as a result of collisions with other vehicles, animals, or fixed objects in the environment. Accidents may also be caused by roadway defects (pavement ridges, potholes, etc.). Table 4-1 presents national statistics on motorcyclist non-traffic, non-fatal injuries ("non-traffic" is defined as any vehicle incident that occurs entirely in any place other than a public highway, street, or road, for example during off-highway riding). The table presents injury statistics for both adults and children 16 years of age and under. Table 4-2 presents national statistics on ATV-related deaths and injuries, while Table 4-3 presents similar ATV statistics for the state of Tennessee.

TABLE 4-1
NATIONAL MOTORCYCLIST NON-TRAFFIC[1] NON-FATAL INJURIES (AVERAGE FOR YEARS 2004 – 2008)
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Average # of Non-Fatal Injuries per Year (All Ages)	*Average # of Non-Fatal Injuries per Year (Children ≤ 16)*
78,832	27,134

Source: Center for Disease Control and Prevention, 2010
1. Non-traffic is defined as any vehicle incident that occurs entirely in any place other than a public highway, street, or road.

TABLE 4-2
NATIONAL ATV-RELATED DEATHS AND INJURIES (AVERAGE FOR YEARS 2002 – 2006)
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Average Reported Deaths per Year (All Ages)	*Average Reported Deaths per Year (Children < 16)*	*Average # of Non-fatal Injuries per Year (All Ages)*	*Average # of Non-fatal Injuries per Year (Children< 16)*
703	154	131,760	40,020

Source: U.S. Consumer Product Safety Commission, 2010

TABLE 4-3
STATE OF TENNESSEE ATV-RELATED DEATHS (1982-2007)
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Reported Deaths (All Ages)*	Total Reported Deaths (Children < 16)
340	83

Source: U.S. Consumer Product Safety Commission, 2010
* Data collection for 2005-2007 is incomplete

Off-road motorcycle riding, like operating motor vehicles on roadways, requires physical skills and judgment that children and young teens do not possess. As the tables indicate, nationally, children are involved in about 34 percent of all non-traffic non-fatal motorcycle injuries. They comprise approximately 22 percent of all ATV-related deaths and 30 percent of non-fatal injuries. Many of these deaths and injuries occur when a child is driving or riding on an adult ATV (Journal of the American Medical Association [JAMA], 2006). Children under 16 on adult ATVs are twice as likely to be injured as those riding youth ATVs (U.S. Consumer Product Safety Commission, 2010).

Although young off-highway motorcyclists generally travel at lower speeds than motorcyclists on public roads and have little risk of collision with automobiles, they face other hazards, including irregularities in terrain and obstacles (e.g., trees and fences). Motocross races (i.e., organized racing of motorcycles on off-highway circuits) present fewer stationary obstructions but involve risk for collision with competing motorcycles and hazards associated with jumps. Patients with injuries from off-highway motorcycle riding who were treated in emergency rooms were more likely to require hospitalization (7.5 percent) than those injured while bicycling (3.7 percent) (JAMA, 2006).

In 2000, the American Academy of Pediatrics recommended that parents not allow children and teens under 16 years of age to ride off-highway motorcycles or ATVs and that states prohibit the use of such vehicles by children and teens in that age group (JAMA, 2006). The State of Tennessee requires that riders under eighteen (18) years of age using publicly owned or leased lands shall, at a minimum, wear a helmet; however, the State does not preclude the use of OHVs by younger riders (Tennessee Code 70-9-105).

4.2.3 Alternative 1: Motocross Area Only

Under this alternative, the environmental consequences associated with safety for the development, maintenance, and use of the motocross course would be the same as those described in Proposed Action. As such, no adverse impacts would occur.

4.2.4 BMPs and Management Actions for Safety

To minimize the potential for injury from OHV use, Arnold AFB would develop a comprehensive OHV rider safety program. Similar programs have been implemented at other Air Force installations. They address requirements related to driver awareness and training, OHV operating equipment, and use of PPE during OHV use (see Appendix A for an example of the 354th Fighter Wing Instruction (FWI) 32-7002, *Use and Control of Off-Highway Vehicles (OHV)*, dated 13 March 2009).

Arnold AFB's program may implement aspects similar to those shown in Appendix A, depending on the scope of the OHV program at Arnold. Arnold AFB would also comply with all requirements identified in AFI 91-207, *U.S. Air Force Traffic Safety Program*. The following is a summary of elements that could comprise part of the overall OHV rider safety program:

- OHV usage would be restricted to Arnold AFB affiliated individuals and dependents.
- OHV users would be required to successfully complete an installation-provided OHV Safety Briefing prior to use of the trail system. This briefing will be used to disseminate safety requirements and other key information, such as trail maps, route marking and signage, emergency contact numbers, etc.
- OHV users would be required to wear appropriate PPE, including: protective helmets meeting minimum applicable specifications; eye protection (face shield or goggles) made of shatter-resistant, transparent material; and full-finger gloves, long-sleeved shirt or jacket, and reflective vests.
- OHV users would be required to follow established speed limits on OHV trails and could not venture beyond approved OHV usage areas.
- OHV users would be required to comply with manufacturer's designed seating capacity.
- OHVs would be required to have working equipment, including brakes, headlights, and taillights.
- OHV riders would have to meet approved minimum age and equipment requirements. For example, FWI 32-7002 (included as Appendix A) stipulates a minimum age of 16 years for riders of machines with an engine capacity of 90 cubic centimeters (cc) or larger. Riders 12 to 15 years old would be limited to 70 to 90cc machines, and riders 6 to 11 years old would be limited to 70cc machines or smaller. Arnold AFB would establish and enforce similar age requirements.

- It is recommended that all riders be required to be certified through the ATV Safety Institute or other such programs to minimize potential accident/injury rates, as is required on many other OHV areas.

Additionally, the use of the trail system during unfavorable weather and/or ground conditions may be prohibited. The trail system would be closed during the gun hunting season during mid-November through the first weekend in January (the motocross area would remain open). During spring turkey hunting season, the trail system may be closed from dawn to noon, and archery hunting in the area may be limited to coincide with gun season only. Finally, Arnold AFB would ensure that the trail system is constructed and maintained to meet current design standards for associated trail difficulty levels and health and safety while meeting other resource requirements.

4.3 Biological Resources

4.3.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.3.2 Proposed Action

Development of the OHV Area

Development of the proposed OHV area and associated trail system could require clearing as much as 8 acres of existing habitat to accommodate the OHV trail system and gravel parking area for loading/unloading OHVs. An additional 14.4-acre area would be converted from former pine plantation to construct the motocross course. Nearly all of the area not currently occupied by loblolly pine plantations is sensitive habitat (global rank G2 or G3). The area of disturbance to sensitive communities can be minimized by siting the parking area and as much of the OHV trail system in areas currently planted with pine and avoiding or minimizing disturbance to natural hardwood forest, woodland, and grassland vegetation types.

Areas of constraint and avoidance are shown in Figure 4-2. Trail development outside existing firebreaks/forestry roadways within the grassland habitats should be avoided, if possible, to prevent damage to a particularly sensitive community and associated sensitive RTE species and to reduce the risk of introduction and spread of IPPs into new areas (these areas are shaded orange).

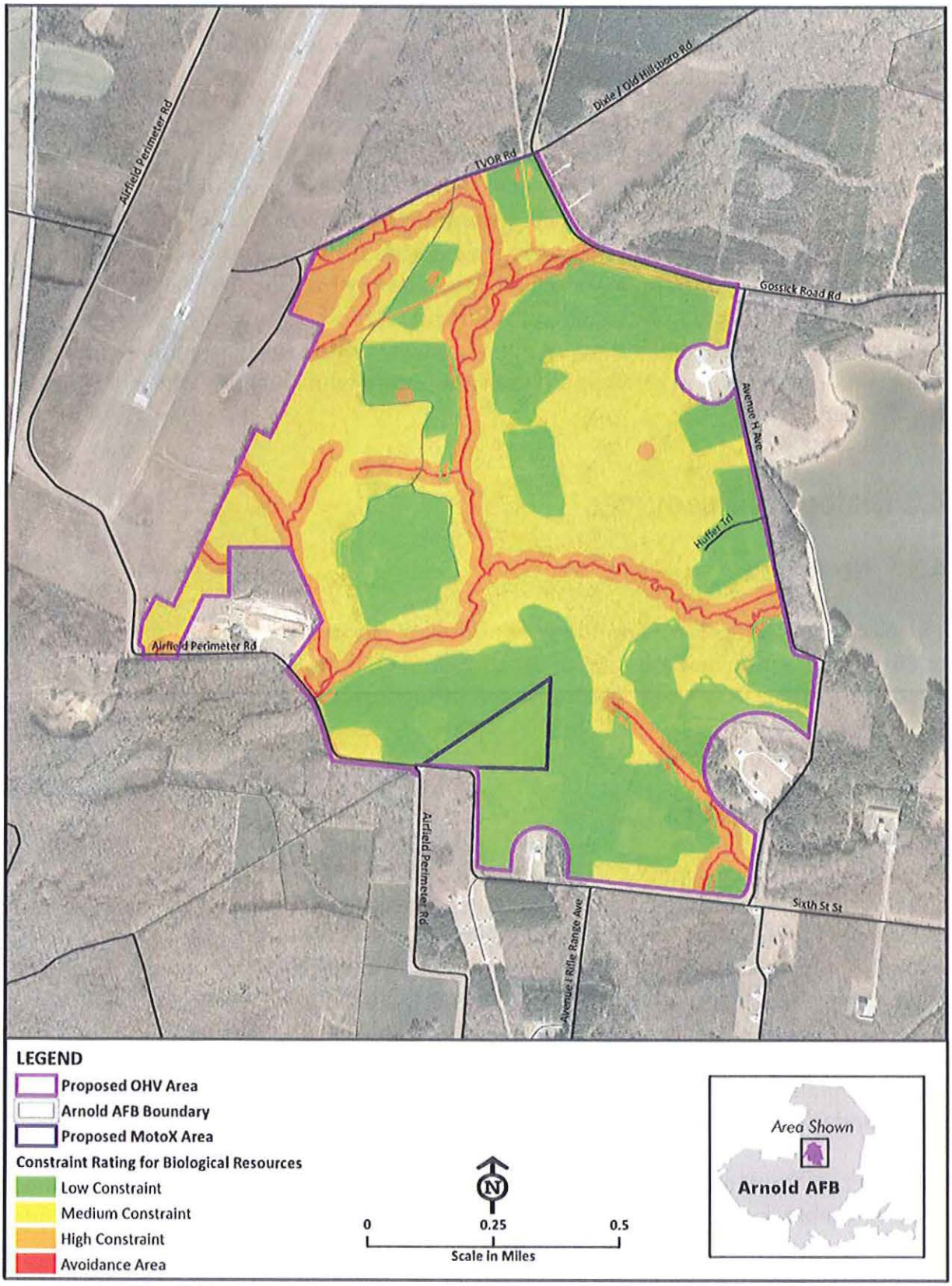

FIGURE 4-2
LOCATION OF BIOLOGICAL RESOURCE CONSTRAINT AREAS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

The grassland habitat in the proposed OHV area is associated primarily with existing utility corridors across the site; the remainder occurs along the Airfield Perimeter Road right-of-way. These areas receive periodic mowing to keep the rights-of-way clear. Construction of the trail system would require some clearing in hardwood forest and possibly woodland habitat. However, new clearing could be minimized by incorporating existing forest roads and firebreaks into the proposed trail system to the maximum extent possible.

Some sensitive species in the areas to be cleared could be killed or injured during trail construction, especially if mechanized equipment is required. Animals like slender glass lizard would be at greatest risk. These instances of injury or mortality would be expected to be limited in occurrence and would not contribute to the decline of any sensitive species populations. Stream habitat for the flame chub is identified as avoidance areas and shaded red in Figure 4-2. Trail development outside existing firebreaks/forestry roadways within these areas must be avoided in order to minimize any potential direct adverse impacts to the species and its habitat. Utilization of existing firebreaks/forestry roadways in these areas would require special considerations to minimize any indirect impacts, such as erosion and runoff (further discussed in the Soils and Water Quality sections). Other RTE occurrences, as well as flame chub habitat, also have a 30-meter buffer; however, areas outside existing firebreaks/forestry roadways should be avoided if practicable and are shaded orange in Figure 4-2. Development of trails outside existing firebreaks/forestry roadways in these areas would require management actions such as signage and warnings to users to keep out of the area.

Impacts to sensitive plants can be avoided by conducting thorough botanical surveys prior to construction and avoiding any RTE plants. Impacts to fish like the flame chub can be controlled by locating trails away from riparian zones and restricting stream crossings within Crumpton Creek and its tributaries to protect flame chub habitat.

There is a slight risk that sparks from mechanized equipment used to clear the trail and parking area could start a wildfire in times of high fire danger. This risk can be controlled by ensuring that all mechanized equipment has fully functional mufflers, spark arrestors, or the equivalent, and that clearing is not done during times of high fire danger.

There is a moderate risk that IPP species could be introduced into areas disturbed by construction of the trail system and motocross area. This risk can be mitigated by requiring all construction vehicles, trailers, and towing vehicles to be clean and free of IPP seeds and parts before they come on base.

Operation

Impacts associated with operation of OHVs on the trail would be similar to, but of smaller in scope, for the impacts described for construction. There are slight risks of mortality to sensitive species, especially animals like slender glass lizard that may occasionally stray into the trail and be run over by an OHV.
There may be slight wildfire risks associated with OHV operation on trails. These risks can be controlled by ensuring that all OHVs have functional mufflers, spark arrestors, or the equivalent, and that operation of OHVs during times of high fire danger is restricted or otherwise monitored closely.

There is a moderate risk that IPP species could be introduced into areas disturbed by the trail and OHV traffic. This risk can be mitigated by requiring all OHVs, trailers, and towing vehicles to be clean and free of IPP seeds and parts before they come on base. Periodic monitoring can identify whether IPP species are invading the trail system, etc.

Maintenance

Impacts from maintenance would be similar to those described from construction and operation of the trail system, motocross area, and parking area.

4.3.3 Alternative 1: Motocross Area Only

Development of the Motocross Area

Impacts associated with construction of the proposed motocross area would be similar to those described for the Proposed Action. However, disturbance would be limited to less than 15 acres of pine plantation habitat.

Operation

Impacts associated with operation of the proposed motocross area would be similar to those described for the Proposed Action. However, disturbance would be limited to less than 15 acres of pine plantation habitat.

Maintenance

Impacts associated with maintenance of the proposed motocross area would be similar to those described for the Proposed Action. However, disturbance would be limited to less than 15 acres of pine plantation habitat.

4.3.4 BMPs and Management Actions for Biological Resources

Adverse impacts can be avoided or minimized through implementation of the following BMPs and management actions:

- Trail development within avoidance areas must be limited to existing firebreaks/forestry roadways. Utilization of existing firebreaks/forestry roadways in avoidance and high constraint areas would require special considerations to minimize any indirect impacts, such as erosion and runoff (further discussed in the Soils and Water Quality sections).
- Avoid to the greatest extent possible trail development within 30 meters of flame chub habitat (Crumpton Creek and its upper tributaries). Any stream crossings in these areas should be either elevated or hardened man-made structures.
- Site the parking area and as much of the OHV trail system in areas currently planted with pine and avoiding or minimizing disturbance to natural hardwood forest, woodland, and grassland vegetation types.
- Utilize existing roadways and firebreaks for OHV trails to the extent possible.
- Avoid trail development within 30 meters of RTE occurrences; signs should be posted at the edges of these buffers to warn users to stay out of the area.
- Avoid, to the extent possible, trail development in grassland habitats near existing utility corridors and along the Airfield Perimeter Road right-of-way.
- Minimize fire risk by ensuring that all equipment and OHVs have functional mufflers, spark arrestors, or the equivalent, and that development of the trail system and operation of OHVs during times of high fire danger is restricted or otherwise monitored closely.
- Require all construction equipment, OHVs, trailers, and towing vehicles to be clean and free of IPP seeds and parts before they come on base.
- Periodically monitor the trail system for RTE or IPP species occurrences.
- Conduct thorough botanical surveys prior to construction and avoid any RTE plants.
- Educate OHV users regarding sensitive habitat and species avoidance areas as part of the OHV program.
- To the extent possible the new OHV trail system and motocross area should be operated in a manner that is compatible with the natural resource management goals as described in the Arnold AFB INRMP (U.S. Air Force, 2006):
    - Military mission (unpredictable)
    - Hunting (known seasons)
    - Forest management activities (thinning, harvest, planting, prescribed burns—described in Work Plans published each year for a two-year planning period; could be other unpredictable activities following extreme weather such as ice storms, tornadoes, etc.)

- Other management activities (natural resource monitoring, habitat improvement, utility rights-of-way (above and below ground)

4.4 Cultural Resources

Potential impacts to cultural resources include disturbance of the physical remains or objects or other elements of an archaeological site including sites and/or objects of religious or cultural importance to Native Americans. The entire proposed area has been surveyed, and any sites determined to be eligible or potentially eligible for the National Register would require protection or mitigation if impacts to these resources are anticipated.

4.4.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.4.2 Proposed Action

Identified cultural resources within this area consist of one potentially eligible archaeological site (40CF287), two archaeological sites under review for eligibility, two identified historic cemeteries, and an American Indian Reinterment site. No historic structures considered eligible for the National Register are located within the OHV area. In addition, there are no identified historic districts or traditional cultural properties present within this area.

Since there are identified locations of potentially eligible sites located within the proposed area, a 100-meter avoidance buffer has been applied to the locations until the evaluation of these sites has been completed (Figure 4-3). If these locations are not avoided, specific mitigations on eligible sites potentially identified may require data recovery efforts and documentation.

Coordination of these activities with the SHPO and other consulting parties would be required to properly comply with Section 106 of the NHPA and to properly identify measures that must be taken to avoid impacting sites of cultural and archaeological significance. Until all cultural resources studies are finalized and the Section 106 process has been satisfied, all potential ground-disturbing activities outside of existing firebreaks/forestry roadways within these buffer areas must be avoided. Known cemeteries should be clearly marked, and any trails outside existing firebreaks/forestry roadways near these areas should be limited to 100 meters from the sites.

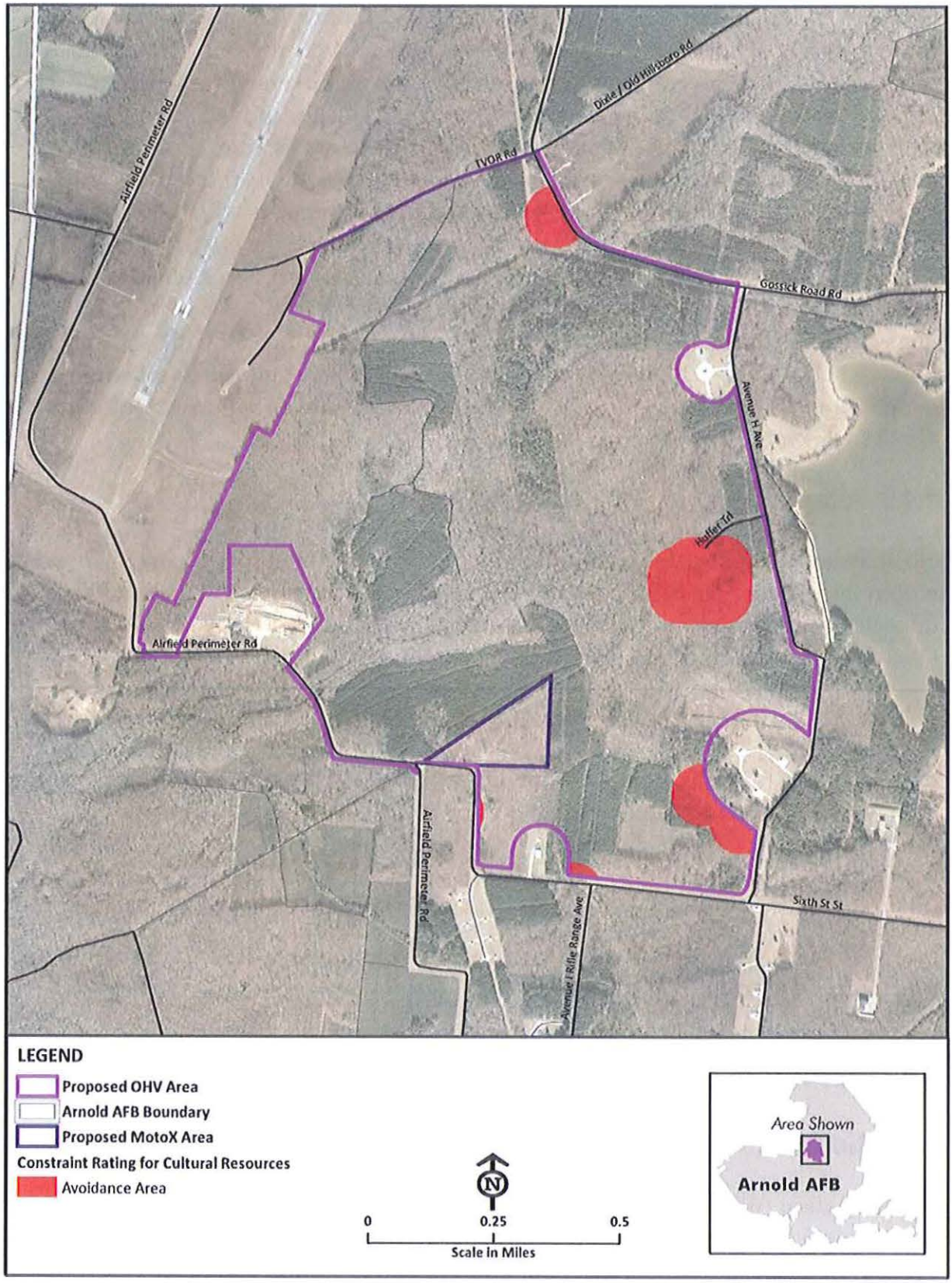

FIGURE 4-3
LOCATION OF CULTURAL RESOURCE CONSTRAINT AREAS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

The Post-review Discoveries approach (36 CFR 800.13) provides a provisional understanding of how historic properties would be treated after project implementation is underway. In the event that historic resources are discovered during trail development, the Arnold AFB Cultural Resources Manager and the Arnold AFB Archaeologist must be notified immediately and all activities must cease in the immediate vicinity until further determination is made by the Arnold AFB Cultural Resources Manager and appropriate consultation requirements with the SHPO and American Indian tribes are completed. Additionally, as per the *Integrated Cultural Resources Management Plan* (ICRMP) for Arnold AFB (U.S. Air Force, 2007b), under Standard Operating Procedure (SOP) #6, should human remains or associated or unassociated cultural objects be inadvertently discovered, then all work shall cease immediately and the site supervisor would notify the base Cultural Resources Manager to determine if Native American Graves Protection and Repatriation Act (NAGPRA) applies.

4.4.3 Alternative 1: Motocross Area Only

No archaeological sites, historic structures, or traditional cultural properties are present within this Alternative area. As a result, the Air Force does not anticipate adverse impacts to cultural resources under this alternative. However, the Post-review Discoveries approach, as described above, would apply to this alternative.

4.4.4 BMPs and Management Actions for Cultural Resources

Adverse impacts can be avoided or minimized through implementation of the following BMPs and management actions:

- No new trails would be developed in areas of cultural resource constraint. OHV use may entail existing firebreaks/forestry roadways in these areas.
- Educate OHV users regarding cultural resource avoidance areas as part of the OHV program.

4.5 Geomorphology and Soils

4.5.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.5.2 Proposed Action

OHV Area Development

Construction of the proposed OHV area and associated trail system could require clearing as much as 8 acres of existing land to accommodate the OHV trail system and the gravel parking area for loading/unloading OHVs. An additional 14.4-acre area would be utilized for the construction and operation of the proposed motocross area. Minimal impacts to soils could result from the development of the parking and unloading/loading area. Soil excavations, vegetation removal, grading, and other construction activities have the potential to disturb soil stability and increase the susceptibility of soil particles to suspension and transport by wind and water. To avoid potential impacts, the parking area should be sited to avoid soils with moderate erosion potential (Mountview gravelly silt loam and Dickson soils greater than 2 percent slope) and those soils with higher potential for and duration of flooding (Purdy, Guthrie and Lawrence soils series).

Construction of the proposed OHV trail system would require some soil disturbance. As with the construction of the parking area, disturbance of soils with moderate erosion potential should be minimized to the extent possible. In general, OHV trails should not be constructed on, or have extended segments on, areas of more than 15 percent slope. Since the majority of the proposed OHV area is on relatively flat terrain, this consideration is not a primary concern; however, to avoid impacts from erosion, construction of the trail system should minimize the number and angle of curves and curve slopes, as these areas are prone to higher erosion rates.

Flooding potential of soils and depth to fragipan should also be considerations in the construction of the trail system. In particular, the Purdy soils present a challenge to construction, as they are prone to frequent flooding and remain flooded for extended periods in wet seasons, have high water capacity, and are poorly drained. Potential impacts can be minimized if trail lengths through the Purdy soils are minimized and/or avoided to the extent possible. The Guthrie and Lawrence soils are also prone to flooding, due to the relatively shallow depth to fragipan (a layer of largely impermeable material) and construction in these soils should be minimized to the extent possible. Figure 4-4 provides soil suitability ratings based upon criteria such as erosion potential, flooding potential, depth to fragipan, and depth to local high water elevation. Areas rated as orange have the highest erosion potential, and development of trails outside existing firebreaks/forestry roadways should be avoided to the extent practicable as these areas would require more extensive mitigations, monitoring, and maintenance than other areas. Areas in yellow are less susceptible to erosion potential and would require less extensive mitigations, monitoring, and maintenance. Areas rated green have the least potential for erosion.

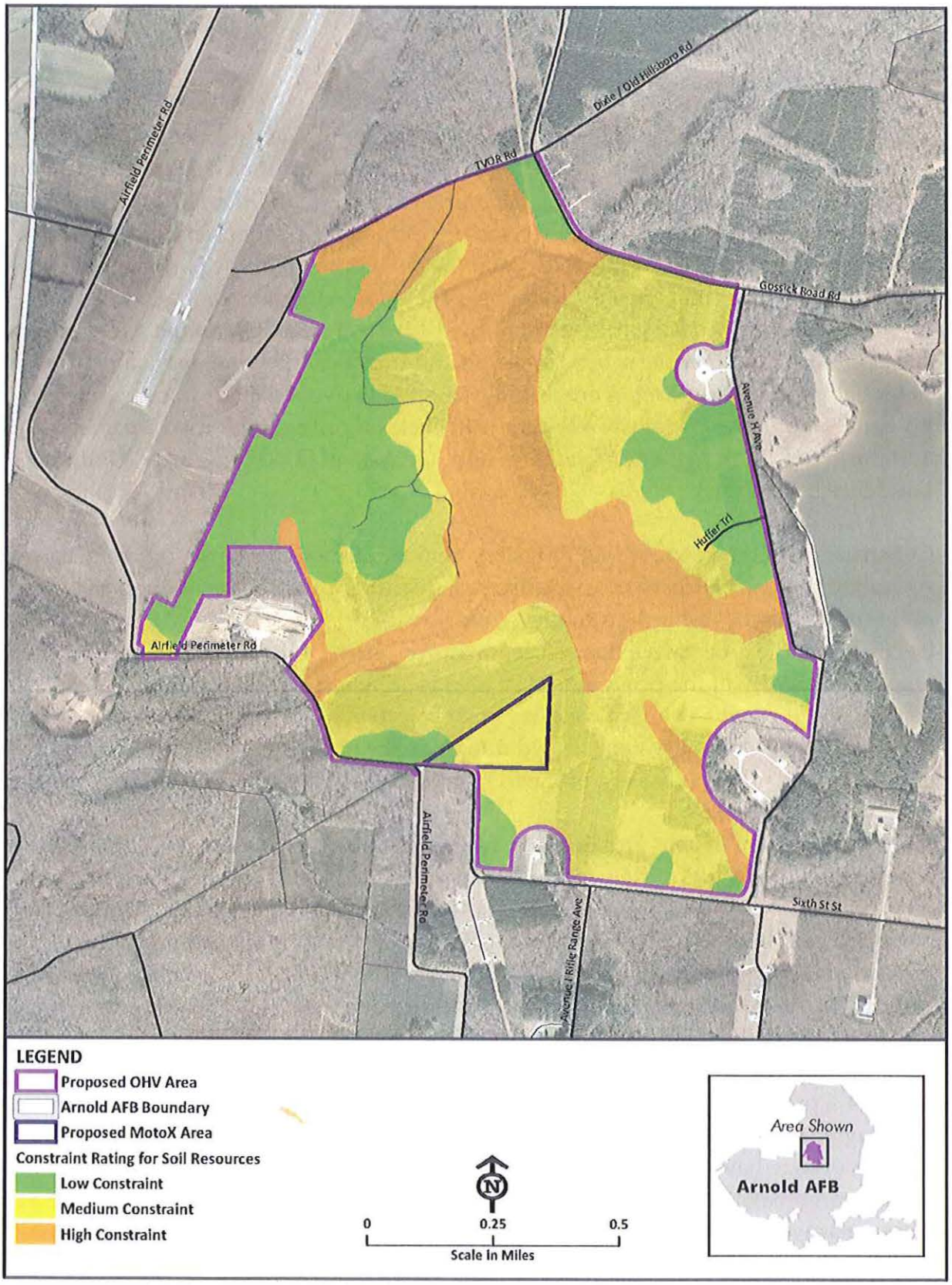

FIGURE 4-4
SOIL LIMITATION RATINGS IN THE PROPOSED OHV AREA
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Operation

Use of the proposed OHV trail system would result in moderate, localized impacts to soils, predominately on the trails themselves. The primary impact to soils would be erosion caused by repeated passes from OHVs; total impact would be dependent upon levels and frequency of use. In general, the relatively flat terrain of the proposed OHV area will help minimize potential erosion and soil transport; however, several studies indicate that repeated use of OHV trails under most conditions (independent of soil environment/climate) will result in erosion and localized soil degradation for all soil types (Sack and DeLuz, 2003; USDA, 2008), though levels of disturbance can be greatly reduced by proper trail design and maintenance (USDA, 2008). If considering year-round, frequent use of an OHV trail, erosion rates on OHV trails can be as high as 0.11 cubic meter per square meter (m^3/m^2) per year, the equivalent of 209 kilograms per square meter (kg/m^2) per year of sediment flux (Sack and DeLuz, 2003).

Potential levels of soil disturbance are directly related to frequency and cumulative amount of use. The Proposed Action delineates three usage categories: low (1,200 to 1,600 trail passes per year), medium (1,600 to 2,760 trail passes per year) and high (2,760 to 4,600 trail passes per year). While it is difficult to quantitatively assess the potential impact to soils based on these categories, it can be assumed that higher usage will result in more potential impacts and the need for maintenance than the low or medium usage categories. Further, it can be assumed that from the usage levels addressed in the Proposed Action, soil erosion rates will not approach the ceiling established by the Sack and DeLuz study. A Forest Service (USDA, 2008) study assessed potential impacts of new OHV trails in forested areas and grasslands (conditions comparable to those in the proposed OHV area) and devised a matrix for rating overall disturbance (see Table 4-4). While there is no assumed direct correlation between the usage levels established in the Proposed Action and the disturbance categories, it is reasonable to assume that impacts from proposed usage on the OHV trail system would fall somewhere on the scale established by the table.

Maintenance

Impacts to soils from maintenance would be similar to those described from construction and operation of the trail system. Ideally, maintenance activities with the intent of environmental restoration (regarding jump and curve slopes, filling in ruts), would negate some impacts related to the OHV trail operation.

TABLE 4-4
TRAIL DISTURBANCE CLASS MATRIX FOR NEW TRAILS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Conditions	*Low Disturbance*	*Medium Disturbance*	*High Disturbance*
Vegetation and Cover Conditions			
Litter and Vegetation	0–30% bare soil	30–60% bare soil	>60% bare soil
Tree Roots	Small roots exposed	Small roots exposed and broken	Large roots exposed and damaged
Rocks	No more exposed or fractured rocks than natural conditions	Exposed and fractured rocks	Large rocks worn around or displaced
Trail Conditions			
Trail width (both tread and displaced material)	54 inches or less	Between 54 and 72 inches. Some trail braiding. Evidence of width increasing.	72 inches or greater. Braided trails evident. Trail width is growing.
Trail tread/surface	Loose material up to 3 inches deep and wide	Loose material 3 to 6 inches deep	Loose material deeper than 6 inches
Rut Depth	Ruts less than 3 inches deep	Ruts 3 to 6 inches deep	Ruts greater than 6 inches deep
Erosion Conditions			
Rill Networks	Little or no rilling, less than 1/3 of trail between water breaks has rills	More than 1/3 of trail between water breaks has rills	Rills evident on more than 1/3 of trail between water breaks
Dust	Less than 3 feet high. Traffic does not slow down. Does not obstruct visibility.	3- to 6-foot cloud. Causes traffic to slow down. Partially obstructs visibility.	Greater than 6 feet high. Causes traffic to slow or stop. Very thick cloud that obstructs visibility.
Soil Conditions			
Depth of A Horizon[1]	Greater than 70% of natural	70 to 50% of natural	Less than 50% of natural

Source: USDA, 2008
1. The *A Horizon* is the topmost soil layer, located just below any surface organic matter and is frequently the zone where most biological activity occurs.

4.5.3 Alternative 1: Motocross Area Only

Development of the Motocross Area

Impacts associated with construction of the proposed motocross area would be similar to those described for the Proposed Action; however, disturbance would be limited to less than 15 acres of soils.

Development of the proposed motocross area would occur on the Dickson silt loam (8.5 acres) and the Lobelville silt loam (5.9 acres). Both soil types occur on relatively flat terrain, have slow to moderately slow permeability, and are well drained. Dickson soils with 2 to 7 percent slope have a moderate erosion potential, but the well-vegetated nature of the surrounding area and relative distance to the nearest water course would

minimize the potential for sediment transport. The Lobelville soils have the potential to flood for brief or very brief periods during wet seasons.

Operation

Impacts associated with operation of the proposed motocross area would be similar to those described for the Proposed Action. Potential soil disturbance would be limited to Dickson and Lobelville soils.

Maintenance

Impacts associated with maintenance of the proposed motocross area would be similar to those described for the Proposed Action. Potential soil disturbance would be limited to Dickson and Lobelville soils.

4.5.4 BMPs and Management Actions for Soils

Adverse impacts can be avoided or minimized through implementation of the following BMPs and management actions:

- Attempt to maximize construction of the OHV trail on existing firebreaks/forestry roadways in stable soils (i.e., soils with slight erosion potential).
- OHV trails should not be constructed in areas of greater than 15 percent slope. Regrade (if possible) trails that cross with slopes greater than 7 percent.
- Avoid construction and restrict use in areas with wet soils or soils prone to flooding.
- Similarly, avoid construction and limit use on soils with fragipan close to the surface or a shallow depth to local high water elevation.
- Attempt to minimize the number and angles of curves and curve slopes, as these areas are subject to higher erosion rates.
- Reduce speed limits around curves.
- Periodically inspect trail(s), especially after rain events, to indentify frequently flooded areas. Apply appropriate maintenance to such areas.
- Restrict trail use during/after extensive rainy periods.
- Track proposed OHV trail system usage though the permitting process.
- Employ regulatory and enforcement procedures to ensure OHV use within the proposed OHV area is limited to established trails.

- During construction of parking area, implement silt fences to avoid soil runoff into local drainages.

4.6 Water Quality and Hydrology

4.6.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.6.2 Proposed Action

OHV Area Development

The proposed construction of the parking and unloading/loading area would not increase the amount of impervious surface in the proposed OHV area since the material proposed for the area is gravel (a more permeable substance than asphalt). Because the proposed motocross area is more than 1 acre in size, development would require a NPDES construction permit through coordination with TDEC. Arnold AFB would need to submit an erosion and sedimentation control plan that incorporates specific conservation and engineering practices or mitigations.

Depending upon the location of the OHV trail system, streams and wetlands have the potential to be impacted by construction; however, with the implementation of buffer zones, adherence to BMPs, and application of mitigation measures, these impacts can be minimized.

As noted in Section 3.6, approximately 31 acres of wetlands occur within the proposed OHV area. As per the base INRMP and other regulatory documents, impacts to wetlands from this Proposed Action must be avoided. As a result, no trails should be constructed within 50 meters of wetland areas, and areas within 250 meters of any wetlands should be avoided for trail construction per the Arnold AFB INRMP. Existing firebreaks/forestry roadways in these areas are suitable for trail use; however, restrictions would be required to minimize indirect impacts such as erosion and sedimentation. Such restrictions would include limiting use during wet/rainy periods and poor trail conditions.

Figure 4-5 shows the recommended buffers around wetlands and identifies water courses in the proposed OHV area.

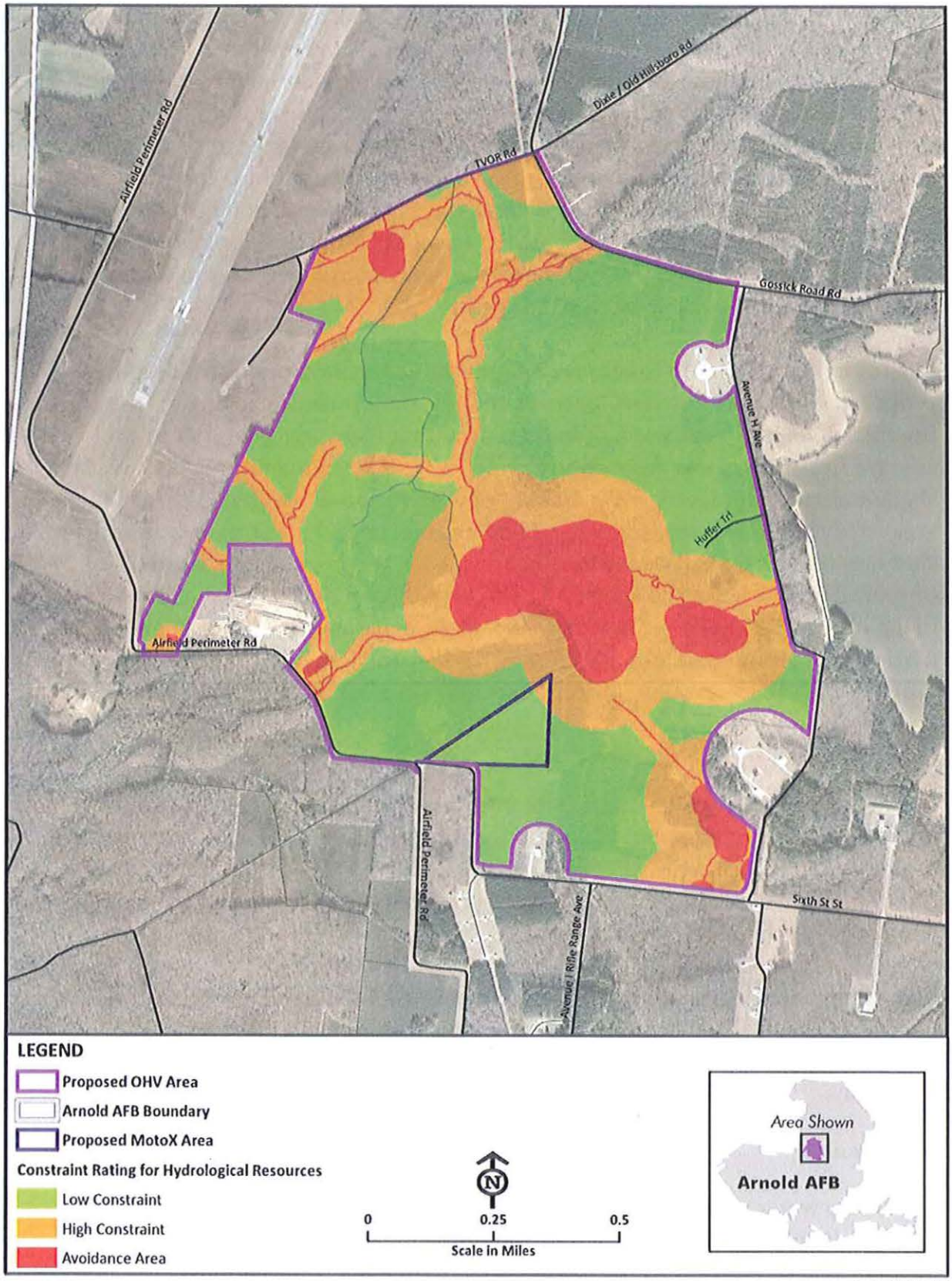

FIGURE 4-5
LOCATION OF HYDROLOGIC CONSTRAINT AREAS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Red areas indicate the wetland areas themselves as well as a 50-meter avoidance area to avoid adverse direct impacts. While existing firebreaks/forestry roadways would be suitable for use in these areas, restrictions would be required to minimize indirect impacts such as erosion and sedimentation. Such restrictions would include limiting use during wet/rainy periods and poor trail conditions. Orange areas indicate an additional 200-meter buffer showing areas that should be avoided for trail development outside of existing firebreaks/forestry roadways to minimize potential indirect impacts to wetland areas in keeping with INRMP principles. Trail development in orange colored areas would necessitate extensive erosion control measures to ensure no indirect impacts to associated wetland areas.

In addition to Crumpton Creek, several intermittent tributaries flow though the proposed OHV area. No development of OHV trails outside existing firebreaks/forestry roadways should occur within these areas in order to avoid direct adverse impacts to these resources. Surface waters and stream channels have been shaded red for avoidance, and a 30-meter buffer (colored orange) has been identified as areas that should be avoided to ensure no indirect impacts to surface waters or stream channels (Figure 4-5). Based upon the prevalence and location of streams in the proposed OHV area, it is considered likely that there will be at least one stream crossing in the proposed OHV trail. If such a crossing is inevitable, it is recommended that a hardened or elevated man-made crossing be constructed in order to minimize potential impacts from OHVs crossing directly through a surface water body or stream channel.

Operation

Potential impacts to wetlands and streams from OHV trail operation are similar to those involved in construction, but slightly larger in scope, and can include increased sediment loads to streams, alteration of stream flow (if an OHV trail runs directly through a stream or if established crossings are not used), and general degradation of wetlands and wetland habitat.

There is a slight risk of stream contamination by POLs (petroleum, oils, lubricants) in the event of an OHV accident in or near a stream crossing. This risk can be reduced by ensuring adherence to speed limit and maintenance of crossings and overall track conditions.

Maintenance

Impacts to water resources and hydrology from maintenance activities would be similar to those described from construction and operation of the trail system. Ideally, maintenance activities with the intent of environmental restoration would minimize or negate some impacts related to the OHV trail operation.

4.6.3 Alternative 1: Motocross Area Only

An NPDES permit would be required for development of this area. Provided that all permit requirements are implemented, construction, operation and maintenance of the proposed motocross area would not adversely impact water quality or hydrology. No wetlands or water bodies are located within the proposed motocross area and no new impervious surfaces (or areas of lower permeability than existing conditions) would be created as a result of this alterative. It should be noted, however, that the northern portion of the proposed motocross area falls within the 250-meter buffer zone for wetlands. As such, this area should be avoided to the extent possible and BMPs and mitigation measures should be applied for the entire proposed motocross area in order to minimize potential indirect impacts to nearby wetlands.

4.6.4 BMPs and Management Actions for Water Quality and Hydrology

Adverse impacts can be avoided or minimized through implementation of the following BMPs and management actions:

- Construction of trails and use of OHVs in wetlands is prohibited by numerous federal, state, and DoD regulations and is to be directly avoided. A 50-meter buffer zone around all wetland areas has been identified as an avoidance area for trail development outside of existing firebreaks/forestry roadways. Existing firebreaks/forestry roadways in these areas are suitable for trail use; however, restrictions would be required to minimize indirect impacts such as erosion and sedimentation. Such restrictions would include limiting use during wet/rainy periods and poor trail conditions.
- At a minimum, new OHV trails should not be constructed within 50 meters of identified wetlands; restrictions on use of existing firebreaks/forestry roadways would be similar to those described previously. As suggested in the base INRMP, trails should not be developed within 250 meters of identified wetlands where practicable. Trail development within 200 meters of the 50-meter avoidance zone and outside existing firebreaks/forestry roadways would require extensive erosion control measures, monitoring, and maintenance activities to ensure minimization of direct and indirect adverse impacts.
- Where an OHV trail crosses a stream, construct a crossing of suitable type as to discourage other navigation (i.e., off trail) of the water course.
- Ensure trail use is limited to designated areas.
- Routinely inspect trails that pass near wetlands and at stream crossings.
- Reduce OHV rider speed near water crossings.

While it is unknown at this time what mitigations would be developed through the NPDES permitting process for the motocross area, potential mitigations based on typical permit requirements are identified below.

- Installation and maintenance of permanent sediment runoff control measures for heavy storm events
- Inspection and maintenance of sediment runoff control measures after rain events
- Stabilization of disturbed areas as soon as possible
- Timing of activities to minimize impacts from seasonal climate changes and weather events
- Construction of stormwater infiltration/collection measures
- Minimization of soil disturbance and leaving of vegetation in place whenever and wherever possible

4.7 Air Quality

In order to evaluate the air emissions and their impact to the overall region of influence (ROI), the emissions associated with the project activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data. Potential impacts to air quality are identified as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10-percent criterion approach is used in the General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. Although the county considered in the analysis is in attainment, the General Conformity Rule's impact analysis was utilized to provide a consistent approach to evaluating the impact of construction and operation emissions. To provide a more conservative evaluation, the impacts screening in this analysis used a more restrictive criteria than required in the General Conformity Rule. Rather than comparing emissions to regional inventories (as required in the General Conformity Rule), emissions were compared only to the appropriate county in which the actions occur and may potentially be impacted, which is a smaller area.

A DoD-developed model, the Air Conformity Applicability Model (ACAM), used by the U.S. Air Force for conformity evaluations was utilized to provide a level of consistency with respect to emissions factors and calculations. Air emissions estimated using ACAM was compared to the established 10-percent criterion for the appropriate county as represented in the NEI (USEPA, 2002). Emissions associated with the construction activities and OHV operation are the main issues generated by the alternatives presented in this document and were the focus of the air analysis.

The analysis for each of the alternatives includes emissions from off-road motorcycles, ATVs, and minibikes. For the analysis of the Proposed Action, a threshold on an individual pollutant-by-pollutant basis has been established. For complete discussion of the methodology is discussed in detail in Appendix B.

4.7.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.7.2 Proposed Action

OHV Area Development

Emissions expected from the establishment of the OHV area are summarized in Table 4-5. These emissions would primarily come from any land clearing required for the trails, motocross, and parking sites. Particulate matter would be the greatest potential emission at 116 tons per year while the clearing activities are occurring. These emissions would be temporary and represent 2.79 percent of Coffee County PM emission, which is within the General Conformity threshold of 10 percent of the region's emissions.

TABLE 4-5
ESTABLISHMENT OF THE OHV PARK AIR EMISSIONS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Emission Activities	Emissions (tons/year)				
	CO	NO_x	PM_{10}	SO_2	VOC
Construction Emissions	1.05	3.96	116.32	0.40	0.42
Coffee County Emissions	30,092.56	6,350.08	4,168.78	4,168.78	715.72
Percentage of County Emissions	*0.00%*	*0.06%*	*2.79%*	*0.01%*	*0.06%*

Operation

Operationally, several possible levels of utilization are analyzed: low, moderate, and high. The emissions from off-road motorcycles, ATVs, and minibikes were utilized. Table 4-6 shows upper limit of the emissions expected for each level of use (i.e., low utilization shows emissions for 35 percent of available time, moderate shows emissions for 60 percent, and high shows 100 percent of the available time). Emissions are expected to be very low even with the OHV area being used 100 percent of the time. Carbon monoxide emissions are the highest at 9.737 tons per year, which accounts for 0.03 percent of Coffee County emissions. This is well within the General Conformity threshold of 10 percent; thus, no adverse impacts are expected from operations at the OHV area.

TABLE 4-6
OPERATIONAL EMISSIONS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Source		Emission Factors (tons/year)				
		CO	NO_x	PM	SO_x	VOC
Coffee County Emissions		*30,093*	*6,350*	*4,169*	*716*	*4,403*
Low	Off-road Motorcycles	1.167	0.007	0.006	0.001	0.460
	ATVs	1.167	0.007	0.006	0.001	0.460
	Minibikes	1.074	0.002	0.008	0.000	0.333
	Total	3.408	0.016	0.020	0.002	1.253
	Percent County Emissions	*0.01%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Moderate	Off-road Motorcycles	2.000	0.012	0.011	0.001	0.789
	ATVs	2.000	0.012	0.011	0.001	0.789
	Minibikes	1.294	0.003	0.005	0.000	0.336
	Total	5.295	0.027	0.026	0.003	1.914
	Percent County Emissions	*0.02%*	*0.00%*	*0.00%*	*0.00%*	*0.01%*
High	Off-road Motorcycles	3.334	0.012	0.011	0.001	0.789
	ATVs	3.334	0.012	0.011	0.001	0.789
	Minibikes	3.069	0.006	0.023	0.001	0.950
	Total	9.737	0.030	0.044	0.003	2.528
	Percent County Emissions	*0.03%*	*0.00%*	*0.00%*	*0.00%*	*0.01%*

4.7.3 Alternative 1: Motocross Area Only

This alternative would establish a motocross course that would cause a temporary increase in particulate matter emissions during the construction of the course (Table 4-5). Emissions would be slightly less than those presented for the Proposed Action as the OHV trails would not be included but would be within the threshold given by the General Conformity Rule. Operational emissions would come from off-road motorcycles and minibikes, similar to the emissions reported for the Proposed Action. No significant adverse impacts are expected to regional air quality from Alternative 1.

4.7.4 BMPs and Management Actions for Air Quality

To decrease particulate matter emissions during site preparation activities (i.e., grading), the use of water on soil piles and exposed surfaces from grading activities would decrease particulate releases.

4.8 Noise

4.8.1 No Action

The No Action Alternative would not result in any additional impacts to the environment within and adjacent to the proposed OHV and motocross locations beyond the scope of normal conditions and influences at these locations.

4.8.2 Proposed Action

Based on literature review, exposure to high levels of OHV noise can result in hearing impairment or even loss, with severe consequences for animals dependent on their sense of hearing for finding prey, avoiding predators, and interacting with other individuals of the same species; wildlife exposed to OHV noise often experience stress and other disturbance effects (Schubert and Smith, 2010).

Determining the effect of noise on wildlife is complicated, however, because responses vary between species and between individuals of a single population. These variable responses are due to the characteristics of the noise and its duration, the life history characteristics of the species, habitat type, season, activity at the time of exposure, sex and age of the individual, level of previous exposure, and whether other physical stresses such as drought are occurring around the time of exposure (Larkin, 1996). Studies have documented hearing loss caused by the noise of dune buggies, dirt bikes, and other OHVs that is inflicted on a wide range of species, including Mojave fringe-toed lizard, kangaroo rat, and birds. Several studies have reported bleeding ears and nasal passages after exposure to OHV activity (Schubert and Smith, 2010). However, most of these studies were conducted in environments that differ from the Proposed Action location (i.e., desert versus forested area).

Loss of hearing sensitivity can lead to increased exposure to predation, increased difficulty killing prey, and disruptions in predator-prey relationships. Specific problems can include the inability to recognize mating signals, warning calls, and calls by juveniles (Schubert and Smith, 2010). Wildlife exposed to noise can suffer high levels of physiological stress even if they appear to fully adapt to the noise (Larkin, 1996). One potential outcome of disturbance effects is displacement. When a species is dependent on a narrow range of habitat characteristics, displacement into marginal or even unsuitable habitat has lasting effects on survival and productivity.

A study that was published in the *Journal of Wildlife Management* in 1975 (Michael Dorrance, "Effects of Snowmobiles on White-tailed Deer") that may shed some light on the issue, and is perhaps a good indicator of potential impacts associated with the Proposed Action, assessed the effects of snowmobile noise on white tailed deer. Between 1973 and 1974 researchers studied the responses of a population of white tailed deer in Minnesota's St. Croix State Park that was exposed to up to 195 snowmobiles per

day compared to the responses of a control population on Mille Laes Wildlife Management Area that had never been exposed to snowmobile noise. While the deer at St. Croix State Park seemed to have become habituated to the noise of the snowmobiles due to years of previous exposure, the deer at Mille Laes Wildlife Management Area appeared to increase their home range size and avoided the snowmobile trails as snowmobile activity increased. In Mille Laes "deer responded to very low intensities of intrusion by man and vehicles. Some deer were particularly sensitive to intrusion by man and vehicle and changed their home ranges to entirely different locations" (Radle, 2010).

Based on information in literature reviews, it is likely that wildlife would experience initial annoyance and flight from trail and motocross area as development activities and operations increase over time. Since the AEDC Security Area is fenced, it is a nearly closed system. Use of the proposed OHV area could result in species such as the white-tailed deer to increase their home range, thus moving into safety zones and archery- only areas and avoid the OHV trails and motocross area as activity increased. There is enough habitat within the AEDC Security Area to support those species that choose to move away from the trail system and motocross area; thus, impacts to species associated with avoidance of usable habitat, habitat fragmentation, and energy depletion are unlikely. Most species would, over time, become acclimated to the noise along with other species that stayed in the area. Wildlife occurrences near trails would likely decline; however, the intermediate areas between trails would likely still support noise-acclimated wildlife. Movement of deer away from the area due to OHV noise may adversely impact deer harvest success in the area during hunting season, thus potentially reducing Arnold AFB's ability to manage the deer population, resulting in an increased deer population within the AEDC Security Area.

In extreme cases, small mammals, amphibians, and avian species may be directly adversely impacted by noise if they are near the trail as an OHV is passing by. It is difficult to gauge the probability of this occurring given the inconclusiveness of scientific information regarding potential noise impacts to varying species, as well as the difficulty in determining the chance of such an occurrence. It is likely that the potential would be low as most species would tend to move away from the area either due to the approaching noise or ground vibration, which would serve to act as a warning mechanism to move away from the area.

4.8.3 Alternative 1: Motocross Area Only

Impacts associated with use of the motocross area would be similar to the Proposed Action in that any species in the area would likely move to another location once development activities begin. Noise from continued use would likely make the motocross area unsuitable for wildlife, and species would likely avoid the area altogether simply because the area would be highly disturbed and unsuitable for habitat. Additionally, once the course is operational, most species would likely keep

their distance from the area due to loud noise and human presence. Since the area is relatively small (14.4 acres) compared to the rest of the installation, noise from motocross activities would not be expected to result in adverse impacts due to the need to avoid the area, and the probability of direct noise-related impacts is low considering that most species would tend to avoid the area.

4.8.4 BMPs and Management Actions for Noise

All OHVs would be required to have a muffler to minimize noise.

4.9 Summary of Potential Constraints

The summary of potential impacts is provided as an overlap of potential constraint areas identified under the specific resource areas (Figure 4-1 through Figure 4-5). The goal of this discussion is to show areas within the proposed OHV area clear of potential constraints (green), areas with minor constraints and management actions (yellow), areas that should be avoided in the absence of management actions (orange), and areas that must be avoided (red) or use would require extensive mitigations (red) when developing either the OHV trail system or the motocross area. The summary map (Figure 4-6) combines all the "stoplight" maps provided in Sections 4.1 through 4.8 (as applicable) to provide an overview of all potential impacts and associated constraints. This summary map can then be used for planning purposes when developing a trail system once the other program elements that dictate the scope of the OHV trail system are identified (e.g., the budget of the program). In most cases, while an area may be identified as a high constraint or avoidance area, there are existing firebreaks/forestry roadways within these areas. In such a situation, trail development within these areas would not result in direct adverse impacts, provided that existing firebreaks/forestry roadways are utilized and OHV use is prohibited off the trail system. Based on geographic information system (GIS) analysis, approximately 7 percent of the area has a low level of constraint, 40 percent of the proposed area has a medium level of constraint and associated management actions, 37 percent of the area should be avoided for trail development to the extent practicable in the absence of existing firebreaks/forestry roadways and mitigative measures, and 16 percent of the area should be avoided entirely or consultations and or/permits and extensive mitigations would be required for use in these areas outside existing firebreaks/roadways.

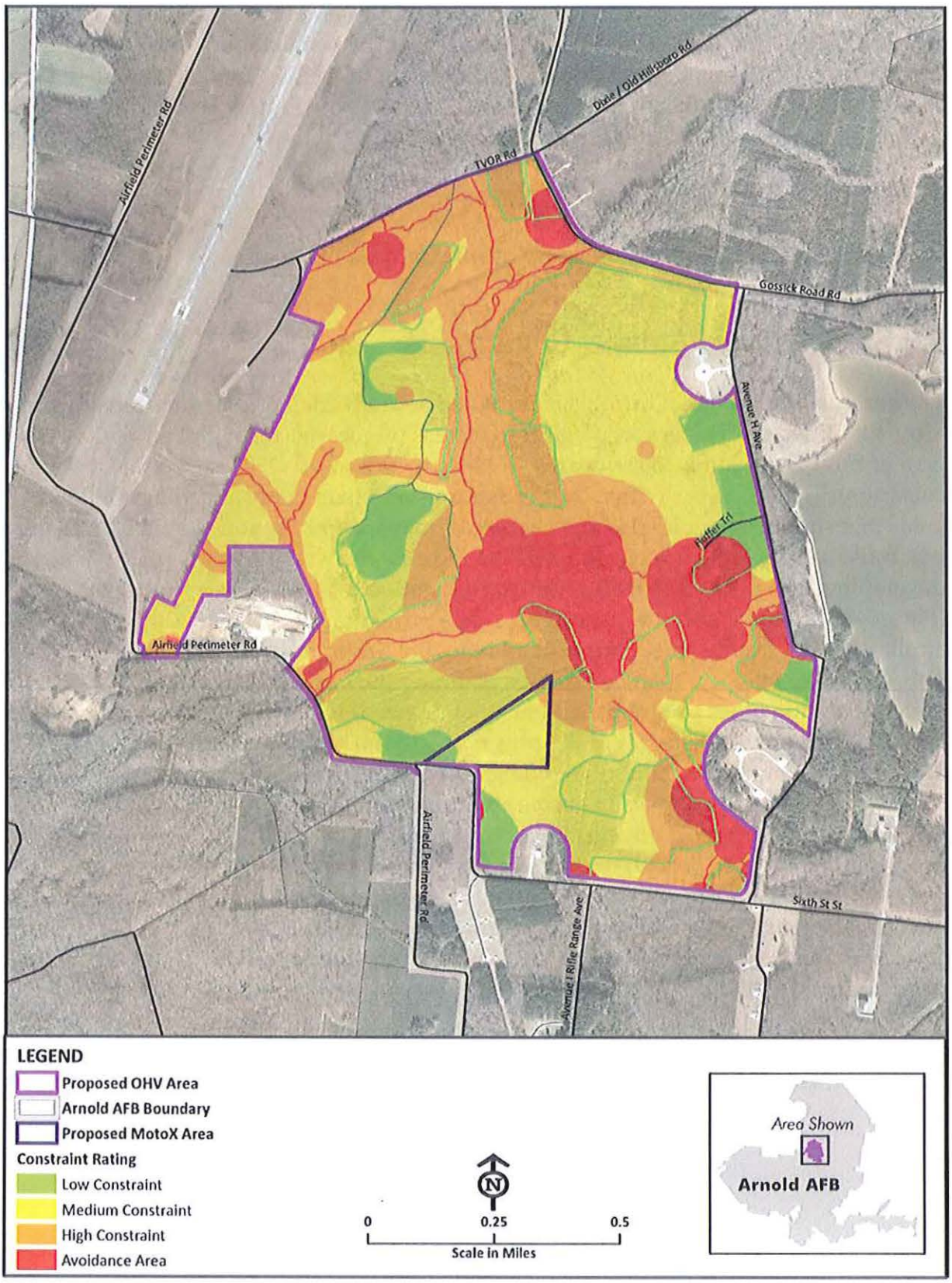

FIGURE 4-6
SUMMARY OF RESOURCE CONSTRAINTS FOR THE PROPOSED AND ALTERNATIVE ACTION
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

4.10 Cumulative Impacts

According to the CEQ regulations, cumulative impact analysis in an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.8). Cumulative effects may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally would tend to offer a higher potential for cumulative effects.

With the exception of typical forestry, recreational, and ecosystem management activities within the proposed location, no other projects have been identified as either near the Proposed Action or as having a cumulative impact on shared resources.

Cumulative effects to natural resources associated with construction, operation, and maintenance of the proposed OHV area and/or the motocross area are expected to be minor. Construction of the vehicle/trailer parking area and the OHV trail system would require clearing no more than 8 acres of hardwood forest and/or pine plantation. If sited correctly, construction of the parking area would minimize impacts to sensitive communities and RTE species. Some minor impacts to sensitive habitats and sensitive species are expected as a result of trail construction, operation, and maintenance. Potential adverse impacts to sensitive habitats can be minimized by siting the parking area and trail system in previously disturbed pine plantations as much as possible and using the existing forest roads and fire trails for the OHV trail system. Potential adverse impacts to sensitive species can be reduced by excluding these activities during sensitive seasons or life stages of sensitive animals and plants (e.g., flowering, fruiting, or breeding seasons). Potential adverse impacts associated with wildfire risk can be mitigated by avoiding operations during time of high fire danger and requiring all vehicles to have fully functional spark arrestors, mufflers, and similar technology.

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5.0 Plan, Permit, and Management Requirements

An NPDES permit would be required for development of the motocross area under both the Proposed Action and Alternative 1. Provided that the development of trail systems avoids wetlands and water bodies, no other permits would be required.

Modification of the Arnold AFB INRMP would be required to accommodate the OHV program.

Arnold AFB would be required to develop a comprehensive OHV rider safety program to address requirements related to driver awareness and training, OHV operating equipment, and use of PPE during OHV use. At minimum, the program would need to cover the following:

- OHV usage would be restricted to Arnold AFB affiliated individuals and dependents.
- OHV users would be required to successfully complete an installation-provided OHV Safety Course prior to use of the trail system. This course would be used to disseminate safety requirements and other key information, such as trail maps, route marking and signage, emergency contact numbers, etc.
- OHV users would be required to wear appropriate PPE, including: protective helmets meeting minimum applicable specifications; eye protection (face shield or goggles) made of shatter-resistant, transparent material; and full-finger gloves, long-sleeved shirt or jacket, and reflective vests.
- OHV users would be required to follow established speed limits and could not venture beyond approved OHV usage areas.
- OHV users would be required to comply with manufacturer's designed seating capacity.
- OHVs would be required to have working equipment, including brakes, headlights, and taillights.

Management Actions

The following summarizes management actions described previously in Chapter 4 that would serve to avoid or minimize potential adverse impacts to respective resource areas.

Land Use

Trails within site WP-12 must utilize existing firebreaks/roadways; minimal ground disturbance for trail preparation would be required in this area.

Closure of the OHV trail system during hunting seasons would minimize any potential adverse land use conflicts with other recreational users and would also serve to minimize any potential safety issues associated with hunters utilizing the area while OHV riders are present. The trail system would be shut down during gun season. Additional closures to consider would be closing the trail system from dawn to noon on weekends during spring turkey season, as well as limiting archery hunting outside of gun season.

Safety

OHV riders may be required to meet approved minimum age and equipment requirements. It is recommended that all riders be required to be certified through the ATV Safety Institute or other such programs to minimize potential accident/injury rates, as is required on many other OHV areas.

Additionally, the use of the trail system during unfavorable weather and/or ground conditions may be prohibited. The trail system may also be closed during the gun hunting season during mid-November through the first weekend in January (the motocross area would remain open).

Finally, Arnold AFB would ensure that the trail system is constructed and maintained to meet current design standards for difficulty and health and safety while meeting other resource requirements.

Biological Resources

- Trail development within avoidance and high constraint areas should be limited to existing firebreaks/forestry roadways. However, restrictions would be required to minimize indirect impacts such as erosion and sedimentation. Such restrictions would include limiting use during wet/rainy periods and poor trail conditions, as well as developing mechanisms for stream crossings to minimize direct impacts from OHV/stream interactions.
- Avoid to the greatest extent possible trail development within 30 meters of flame chub habitat (Crumpton Creek and its upper tributaries). Any stream crossings in these areas should be either elevated or hardened man-made structures.
- Site the parking area and as much of the OHV trail system in areas currently planted with pine and avoiding or minimizing disturbance to natural hardwood forest, woodland, and grassland vegetation types.

- Utilize existing roadways and firebreaks for OHV trails to the extent possible.
- Avoid trail development within 30 meters of RTE occurrences; signs should be posted at the edges of these buffers to warn users to stay out of the area.
- Avoid, to the extent possible, trail development in grassland habitats near existing utility corridors and along the Airfield Perimeter Road right-of-way.
- Minimize fire risk by ensuring that all equipment and OHVs have functional mufflers, spark arrestors, or the equivalent, and that development of the trail system and operation of OHVs during times of high fire danger is restricted or otherwise monitored closely.
- Require all construction equipment, OHVs, trailers, and towing vehicles to be clean and free of IPP seeds and parts before they come on base.
- Periodically monitor the trail system for RTE or IPP species occurrences.
- Conduct thorough botanical surveys prior to construction and avoid any RTE plants.
- Educate OHV users regarding sensitive habitat and species avoidance areas as part of the OHV program.
- To the extent possible the new OHV trail system and motocross area should be operated in a manner that is compatible with the natural resource management goals as described in the Arnold AFB INRMP (U.S. Air Force, 2006):
    - Military mission (unpredictable)
    - Hunting (known seasons)
    - Forest management activities (thinning, harvest, planting, prescribed burns – described in Work Plans published each year for a two-year planning period; could be other unpredictable activities following extreme weather such as ice storms, tornadoes, etc.)
    - Other resource management activities (natural resource monitoring, habitat improvement, utility rights-of-way (above and below ground)

Cultural Resources

- No trails outside of existing firebreaks/forestry roadways would be developed in areas of cultural resource constraint.
- Educate OHV users regarding cultural resource avoidance areas as part of the OHV program.

Geomorphology and Soils

- Attempt to maximize construction of the OHV trail in stable soils (i.e., soils with slight erosion potential).

- OHV trails should not be constructed in areas of greater than 15 percent slope. Regrade (if possible) trails that cross with slopes greater than 7 percent.
- Avoid construction and restrict use in areas with wet soils or soils prone to flooding.
- Similarly, avoid construction and limit use on soils with fragipan close to the surface or a shallow depth to local high water elevation.
- Attempt to minimize the number and angles of curves and curve slopes, as these areas are subject to higher erosion rates.
- Reduce speed limits around curves.
- Periodically inspect trail(s), especially after rain events, to indentify frequently flooded areas. Apply appropriate maintenance to such areas.
- Restrict trail use during/after extensive rainy periods.
- Track proposed OHV trail system usage though the permitting process.
- Employ regulatory and enforcement procedures to ensure OHV use within the proposed OHV area is limited to established trails.
- Ensure that the development of the OHV trail system and motocross area implements soils BMPs in addition to other situation-appropriate methods as per the *Tennessee Erosion and Sediment Control Handbook* (TDEC, 2002).

Water Quality and Hydrology

- Construction of trails and use of OHVs in wetlands is prohibited by numerous federal, state, and DoD regulations and is to be directly avoided. A 50-meter buffer zone around all wetland areas has been identified as an avoidance area for trail development outside of existing firebreaks/forestry roadways. Existing firebreaks/forestry roadways in these areas are suitable for trail use; however, restrictions would be required to minimize indirect impacts such as erosion and sedimentation. Such restrictions would include limiting use during wet/rainy periods and poor trail conditions.
- At a minimum, new OHV trails should not be constructed within 50 meters of identified wetlands; restrictions on use of existing firebreaks/forestry roadways would be similar to those described previously. As suggested in the base INRMP, trails should not be developed within 250 meters of identified wetlands where practicable. Trail development within 200 meters of the 50-meter avoidance zone and outside existing firebreaks/forestry roadways would require extensive erosion control measures, monitoring, and maintenance activities to ensure minimization of direct and indirect adverse impacts.

- Where an OHV trail crosses a stream, construct a crossing of suitable type as to discourage other navigation (i.e., off trail) of the water course.
- Ensure trail use is limited to designated areas.
- Routinely inspect trails that pass near wetlands and at stream crossings.
- Reduce OHV rider speed near water crossings.

Air Quality

- To decrease particulate matter emissions during site preparation activities (i.e., grading) the use of water on soil piles and exposed surfaces from grading activities would decrease particulate releases.

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6.0 List of Preparers

Akstulewicz, Kevin D.
Senior Environmental Project Manager
B.S. Environmental Science/Policy
11 years of experience

Groton, James
Environmental Scientist
M.S. Forestry, B.S. Natural Resources
31 years of experience

Baumann, Alysia
NEPA Planner/Specialist
B.S. Chemical Engineering
6 years of experience

Diaz, Luis
Senior Project Manager, Environmental Engineer
M.S. Civil-Environmental Engineering
17 years of experience

Dehn, Daniel F.
Environmental Analyst
M.A. English, B.A. English, B.S. Geology
5 years of experience

Gordon, Heather
Environmental Analyst (GIS Specialist)
M.S. Geography
12 years of experience

Utsey, Tara D.
Technical Editor
B.A. Liberal Arts
15 years of experience

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APPENDIX A
354TH FIGHTER WING INSTRUCTION 32-7002

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BY ORDER OF THE COMMANDER,
354TH FIGHTER WING (PACAF)

354TH FW INSTRUCTION 32-7002

13 MARCH 2009

Civil Engineer

USE AND CONTROL OF OFF-ROAD VEHICLES (ORV)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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Supersedes 354 FWI 32-7002, 10 October 2005 — Pages: 11

This instruction implements AFPD 32-70, *Environmental Quality*, establishes procedures and responsibilities for controlling ORV, prescribes ORV operating conditions, ensures natural/cultural resources protection, establishes a safety and accident prevention program, and minimizes use conflicts. This instruction applies to all military units, personnel assigned or attached to Eielson AFB, civilian employees, military dependents, and all other individuals while on Eielson AFB land. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 37-123, *Management of Records*, and disposed of in accordance with Air Force Web-RIMS *Records Disposition Schedule (RDS)* located at https://afrims.amc.af.mil. Public Law 104-13, *The Paperwork Reduction Act of 1995*, and AFI 33-360, Volume 2, *Content Management Program-Information Management Tool (CMP-IMT)*, affect this publication. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

Wing Safety: Added the requirement for the ATV Safety Institute (ASI) card and the completion of the PACAF CARES program (paragraph **1.4** and **2.2.2-2.2.4**); Operator License and Age requirements: Added the requirement for owners to carry the ASI card, (paragraph **3**); Safety Education Program: Added the new training requirements (paragraphs **4.1-4.2**); deleted the cross-country ski area between French Creek, the Youth Center, and cooling ponds (paragraph **9.12**); added all grassed areas within the cantonment area, Mullins Pit, and Cathers Lake (paragraph **9.14**); Qualifications Prescribed: Added the ASI card (paragraph **15**).

1. Responsibilities:

1.1. **Civil Engineer.** Responsible for maintaining ORV hands-on training site. Prescribes ORV operating conditions protective of natural/cultural resources and minimizes use conflicts.

1.2. **Natural/Cultural Resources.** Maintains appropriate signs and barricades to delineate and protect trails and special-use areas, monitors ORV impacts, and modifies this instruction when warranted.

1.3. **Security Forces.** Provides policy enforcement through patrols and handles violations in accordance with military directives.

1.4. **Wing Safety.** Implements and monitors ORV safety education and accident prevention program for two-wheeled vehicles, ATVs, and snowmobiles. Wing Safety incorporates these instruction policies into the safety training and issues the ASI card to active duty personnel and the AF Form 483, Competency Card, to dependants who successfully complete the course.

1.5. **ORV Operators.** Report all infractions to this policy or unsafe behavior to Security Forces (Bldg 434).

2. Registration:

2.1. **State.** Current registration with any state is required for all privately-owned ORV prior to operation on base. If required, display the state registration decal as outlined by state law. An ORV is considered operational if parked next to home, dorm, or work place and must therefore be registered with any state.

2.2. **Base:**

2.2.1. All privately-owned ORVs not registered as street vehicles will be registered with Security Forces prior to operating on base. An ORV is considered operational if parked next to home, dorm, or work place and must therefore be registered with Security Forces.

2.2.2. To register an ORV, the owner must: (1) complete the PACAF CARES program; (2) attend the ASI hands-on rider's course scheduled by Wing Safety and must have the ASI card showing proof of course completion; and (3) present proof of ownership and current registration from any state to Pass and Registration.

2.2.3. After completion of the ASI rider's course, the rider must go to Pass and Registration to obtain a decal. Affix the decal to the ORV above or below the state registration decal or as directed by Pass and Registration.

2.2.4. ORVs must be permanently registered within 3 days after completion of the ASI safety course.

3. Operator License and Age Requirements. To operate an ORV, active duty personnel must have the ASI card and dependants must have an AF Form 483, Competency Card, and meet minimum age requirements as outlined in attachment 2. Operators must carry these cards with them at all times while operating on base.

4. Safety Education Program:

4.1. A snowmobile (AF Form 483) or ATV (ASI) course are prerequisites for registration and operation of ORVs on base.

4.2. Wing Safety will give the appropriate ORV handout to everyone attending the courses listed above. Safety will prepare and supply the handouts to the attending individuals.

5. Liability Insurance. All ORVs will be insured per AFI 32-7064, 17 September 2004, Paragraph 10.3.1.

6. Mandatory ORV Equipment. All ORVs operating on Eielson AFB will have the following:

6.1. Working brakes, headlights, and taillights.

6.2. Factory installed exhaust system (or equivalent) in good working order for constant operation. No excessive noise, pollutants, or muffler cutout, bypass, or similar devices allowed.

7. Safety Requirements:

7.1. The following are applicable to all ORVs:

7.1.1. The manufacturer's designed seating capacity will not be exceeded.

7.1.2. A rigid tow bar is required to tow passengers in a sled, trailer, cart, inner tube, toboggan, etc.

7.1.3. All racing and competition events are prohibited on base except as authorized by the Mission Support Group Commander. Requests to have races or competition events will be submitted to the Mission Support Group Commander through Natural/Cultural Resources and Wing Safety.

7.2. Protective helmets meeting minimum DOT, Snell, or ANSI specifications are required for persons riding or being towed by ORV on Eielson AFB.

7.3. Eye protection (face shield or goggles) made of shatter-resistant, transparent material is mandatory.

7.4. The use of head and taillights is mandatory when using an ORV or motorcycle on Eielson AFB.

7.5. Full-finger gloves, long-sleeved shirt or jacket, reflective vest, long pants, and over-the-ankle boots are mandatory for motorcycle, trail bike, and ATV operators.

8. Rules Governing Operation:

8.1. No one will operate an ORV on Eielson AFB lands:

8.1.1. In a reckless or negligent manner, under the influence of alcohol or drugs, or in such a manner as to damage or destroy government or private property.

8.1.2. In excess of established speed limits (posted speed limits or those established by this instruction).

8.1.3. Beyond existing trails, right-of-ways, or approved ORV usage areas.

8.1.4. To chase, disturb, or in any manner cause disruption of normal wildlife activities.

8.2. Persons under 16 years of age must be under the direct supervision of their parent or legal guardian. Twelve to 15 year olds can operate 90cc or under ORV; 6 to 11 year olds can operate any ORV under 70cc. Direct supervision is riding the same ORV if the seating capacity is not exceeded or another ORV within 100 feet to the youth.

8.3. Non-street legal ORVs will be transported on a trailer through the main gate.

8.4. Operating non-street legal ORVs on any maintained paved or gravel roads or parking areas is prohibited. The following exceptions apply:

8.4.1. During snowmobile season, snowmobiles and ATV use is allowed on the shoulders of the following roads: Manchu Trail east of the French Creek bridge, , from the intersection of and roads west of the . Road use is allowed on the Trans-Alaska pipeline to the base boundary and the military pipeline. Obeying posted speed limits and operating on the road's extreme right-hand side is mandatory. Attachment 4 is a map illustrating the usage areas.

8.4.2. During snowmobile closed season, privately-owned ATV and trail bikes must take the most direct access route to get to usage areas. Attachment 3 is a map illustrating the usage areas. Operators using the ATV and trail bike access routes to get to use areas will possess a base certificate of competency. Housing occupants cannot operate west or south of . To access use areas, dorm residents in buildings 2322, 2334, 2346, and 2354 will use the East Loop Road behind the dorms and proceed through the CE shop parking area between buildings 2350 and 2351, turn left, proceed to the parking area entrance off Central Avenue, use Central Avenue to Manchu Trail, and use Manchu Trail, Arctic Avenue, the military pipeline, or Transmitter Road. To access use areas, dorm residents in buildings 2381, 2315, 2333, 2345, and 2353 will use to the BX Service Station, cross to Manchu Trail, and use Manchu Trail, , and . Operation on between and is prohibited. ATV and trail bikes are prohibited from operating on of Mullins Pit and west of . ATV and trail bike operations are limited to the extreme right-hand side of these streets. The speed limit on these roads is 15 mph. When crossing a bridge or culvert on a road not permitted for ATV or trail bike use, the speed limit is restricted to maintaining forward motion, roughly 5 mph.

8.4.3. ORV can operate within the military and the Trans-Alaska pipelines right-of-away. A right-of-way use guideline (RUG) card from Alyeska Pipeline Service Company is required to access the Trans-Alaska pipeline. Possession of the RUG card and a base certificate of competency are mandatory while riding on the Trans-Alaska pipeline.

8.5. ORVs must operate off the drivable road surface except on those roads authorized for ORV use.

8.6. ORV use is prohibited in or adjacent to areas where training is being conducted, children are playing, or heavy equipment is operating.

8.7. ORV will not be driven to and from duty sections or places of employment.

8.8. Firearms or other hunting instruments can be carried on any ORV. ORV operators will comply with 354 FWI 32-7001, *Conservation and Management of Natural Resources,* concerning the discharge and use of firearms on Eielson AFB. Firearms will be in plain view and unloaded when being carried on an ORV to or from authorized hunting areas. It is prohibited to leave firearms unattended or unsecured.

8.9. Crossing streams with ORVs where no bridge, culverts, or designated crossing exists is prohibited, except when the ground and stream are frozen enough to support ORV and operator.

8.10. Snowmobile use is prohibited until there is adequate snow cover to prevent damage to underlying terrain. The Mission Support Group Commander determines the beginning and end of the snowmobile season on Eielson AFB.

8.11. Completely steel tired or tracked, medium or heavy ORVs will not be operated on base.

8.12. No licensed privately owned vehicles are allowed off-road on Eielson AFB.

9. Closed Areas. The following areas are closed to all ORV use:

9.1. Airfield.

9.2. Firing range and impact area.

9.3. Asbestos landfill, soil remediation area, and fire training area.

9.4. Quarry Road and Engineer Hill Munitions Storage areas.

9.5. EOD controlled Area and the public transportation route of potential explosion sites.

9.6. Ski slope and sledding hill next to ski lodge.

9.7. POL tank farms.

9.8 Sewage lagoon and treatment area.

9.9. Par course trail, picnic area, and Eielson AFB self-guided nature trail.

9.10. Arctic survival training area and command post.

9.11. Cross-country ski area bounded by the ski slope, the east and south boundaries of Eielson AFB, and Quarry Road, as well as 160 acres in the Yukon Maneuver Area permitted for use to Eielson by the Army.

9.12. Area bounded by Central Avenue, Transmitter Road, Garrison Slough, north base boundary, and Old Richardson Highway is closed to ORV use. This area includes the main gate and railroad tracks north of . The ORV hands-on training site is exempt for training classes only.

9.13. Archery practice and field ranges and trap/skeet range.

9.14. When snowmobile season is closed, ORV operation is prohibited on the dike surrounding and French Creek subdivisions, , wildlife management areas, on paved bike trails and all grassed areas within the cantonment area, Mullins Pit, and . ORV use is prohibited in Mullins Pit and areas when construction equipment is operating.

9.15. The forested buffer zone around Manchu Ponds.

9.16. School grounds to include the high school football field and track.

9.17. When there is no snow cover on the ground, ORVs may only be used to access campsites from the roads within the Chena River Campground.

9.18. DET 460 AFTAC, Remote Operating Facility. Access to the Yukon Training Area via is allowed. The access route to other Army ORV areas within the Yukon Training area is restricted to the road only.

9.19. "C" off in the Yukon Maneuver Area.

9.20. Birch recreation area.

9.21. In the base cantonment area, ORVs will not operate or park on grass areas, sidewalks, lawn areas, and athletic fields except during snowmobile season.

9.22. During the closed snowmobile season, ORVs are prohibited from operating in wetlands, see Attachment 3.

10. Designated Use Areas. ORVs will be operated only in or on the following designated areas or trails (See attachments 3 and 4; additional maps are available at Natural Resources, building 2215.):

10.1. **Two-Wheeled ORVs:**

10.1.1. The use of motorcycles and motor scooters is prohibited on Eielson AFB except on maintained roads to access designated-use areas (areas not listed in paragraph 9).

10.1.2. The use of trail bikes is prohibited on Eielson AFB except in designated-use areas (areas not listed in paragraph 9) and on designated access routes, paragraph 8.4.2.

10.1.3. When there is snow cover on the ground, two-wheeled ORV use is prohibited.

10.2. **Four-Wheeled ORVs:**

10.3. **Snowmobiles:**

10.3.1. Eielson AFB snowmobile use is prohibited except on specific access routes, paragraph 8.4.1., in designated-use areas (areas not listed in paragraph 9).

10.3.2. Operation in the base cantonment area:

10.3.2.1. Base cantonment operations are limited to the most direct route necessary to reach designated use areas. The base cantonment area is the transit zone to the designated usage areas only, not a designated use area.

10.3.2.2. Operation on streets or parking areas is limited to crossing perpendicular to traffic flow. Snowmobiles will yield the right-of-way to vehicles and pedestrians at all times.

10.3.2.3. The cantonment speed limit for snowmobiles is restricted to maintaining forward motion, roughly 5 mph. Operators will take the most direct route to designated-use areas and maintain a 100-feet building separation. When 100-feet separation is not possible, transit the buildings at an equal distance.

10.3.3. Snowmobilers meeting all the requirements for on-base operation can only enter/exit Eielson AFB using or the Trans-Alaska pipeline off.

11. Public Access. The public can obtain base ORV privileges, subject to safety, property security, mission requirements, and all restrictions and rules stated in this instruction.

12. ATV, Snowmobile Parking, and Storage . ATV storage next to base family housing or dormitories year round is permissible. During summer months, ATV is to be parked in a parking space, garage, or patio, or adjacent to dormitories as directed by the dorm manager as allowed. No ATV parking on seeded areas is allowed from April though October. During the snowmobile season, ORV parking on frozen, snow-covered lawns adjacent to assigned quarters is allowed. Snowmobiles are not year-round vehicles; summer storage in either assigned garages or the recreational vehicle storage lot and is mandatory.

13. Exceptions:

13.1. Government-owned and leased ORVs used for official duties may operate in closed areas and on closed roads. Operation is restricted to official duties only. When time allows, permission shall be obtained from the proper closed, off-limits, or controlled area custodian. The operator is liable for any damage to natural/cultural resources and must comply with the base ORV safety prevention program.

13.2. Government-owned ORVs will have an Air Force vehicle registration number or marked as follows:

13.2.1. Either USAF or the organizational name will be stenciled or attached using a metal plate to both sides of the snowmobile cowling, gas tank, or below the handlebars on an ATV.

13.2.2. The lettering must be at least 1 3/4 inches in height and contrast with the color of the vehicle.

13.3. Direct written requests to operate personal ORVs in closed areas to Natural/Cultural Resources. A request will contain a reason and length of entry, type, color, and year of ORV, and ORV license and registration number. Natural/Cultural Resources will coordinate the request with the proper authorities. Both Natural/Cultural Resources and the property custodian will approve the request before it can be granted. Natural/Cultural Resources will forward an approved request copy to the Security Forces.

14. Violations:

14.1. Instruction violations include: Violating state and base ORV registration requirements, operator license, age requirements, mandatory equipment requirements, safety requirements, rules governing ORV operation, trespassing in closed areas, or ATV and snowmobile parking and storage rules.

14.2. Persons committing a violation will lose base ORV privileges for a minimum of 30 days on the first offense, 90 days on the second offense, and be permanently barred from base after a third offense. Assessment of traffic points under AFI 31-204, *Air Force Vehicle Traffic Supervision*, is also possible.

15. Qualifications Prescribed: ATV Safety Institute rider card or AF IMT 483, Certificate of Competency, for dependant ATV riders and for snowmobile operators.

MARK W. GRAPER, Brigadier General, USAF
Commander

Attachment 1

GLOSSARY OF TERMS AND SUPPORT INFORMATION

TERMS:

Off-road vehicles (ORV) – Includes all ATV, trail bike (non-street legal motorcycle), or snowmobiles.

All-Terrain Vehicles (ATV) -- Tracked vehicles, low-pressure, flotation-type tired vehicles, amphibious machines including airboats, and air cushion vehicles primarily designed for recreational purposes. Examples include: Honda, Kawasaki, Polaris, Suzuki, Yamaha, or other brand three or four wheelers.

Medium Weight ATV-- Argo, Big Mac, Coot, Cushman Trackster, Eagle, Pac-Trac, Playcat, Raidtrac 718, Ranger Ferret, Sidewinder, and so on.

Heavy Weight ATV-- Bombardiers, Kid, Nodwell, Raidtrac 1800, Sno Cats, Surplus Military Track Vehicles, Thiokol, Weasel, SUSV, and so on.

Snowmobiles -- Any vehicle propelled by mechanical power, steered by using skis, and designed to travel over ice and snow.

Trail Bike -- A two-wheeled ORV not meeting the requirements for on-street operations, e.g., motor cross motorcycle, dirt, or mini bike.

Requirements for On-street Operation -- Vehicle must have mandatory equipment required for on-street operation, vehicle must be properly registered, and operator must be properly licensed.

Attachment 2

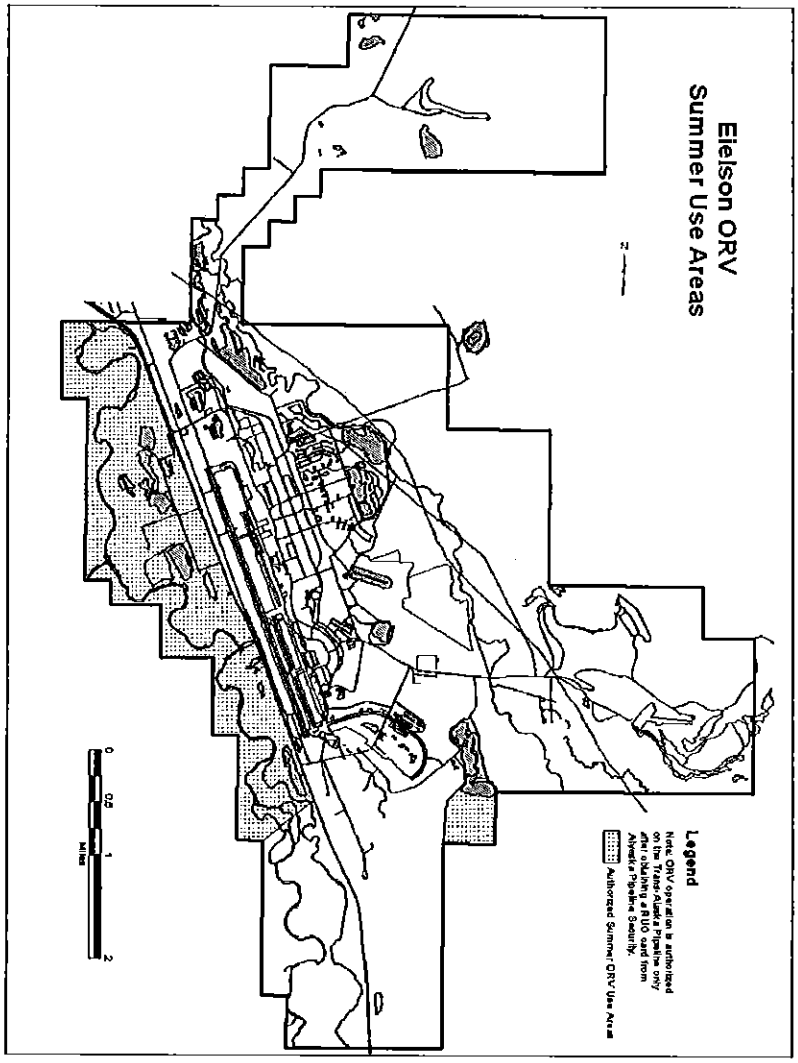
REGISTRATION/LICENSE/SAFETY COURSE REQUIREMENT/MINIMUM AGE

		Registration		Operators License		Safety[3]	Min Age[5]
		State	Base[1]	State	Base[2]		
Four-Wheeled ORV			X	X			
Two-Wheeled ORV	Non-Street Legal Motorcycle	X	X		X	X[4]	6
	Motor Scooter		X		X	X[4]	6
ATV	4 Wheelers	X	X		X	X[4]	6
Snowmobiles		X	X		X	X	10

1. Must be registered as a street vehicle or under a separate local system.
2. Base Certificate of Competency.
3. Safety Education Course.
4. PACAF CARES program.
5. Sixteen for 90cc machines, or larger; 12-15 for 70-90cc machines; and 6-11 for 70cc machines or less.

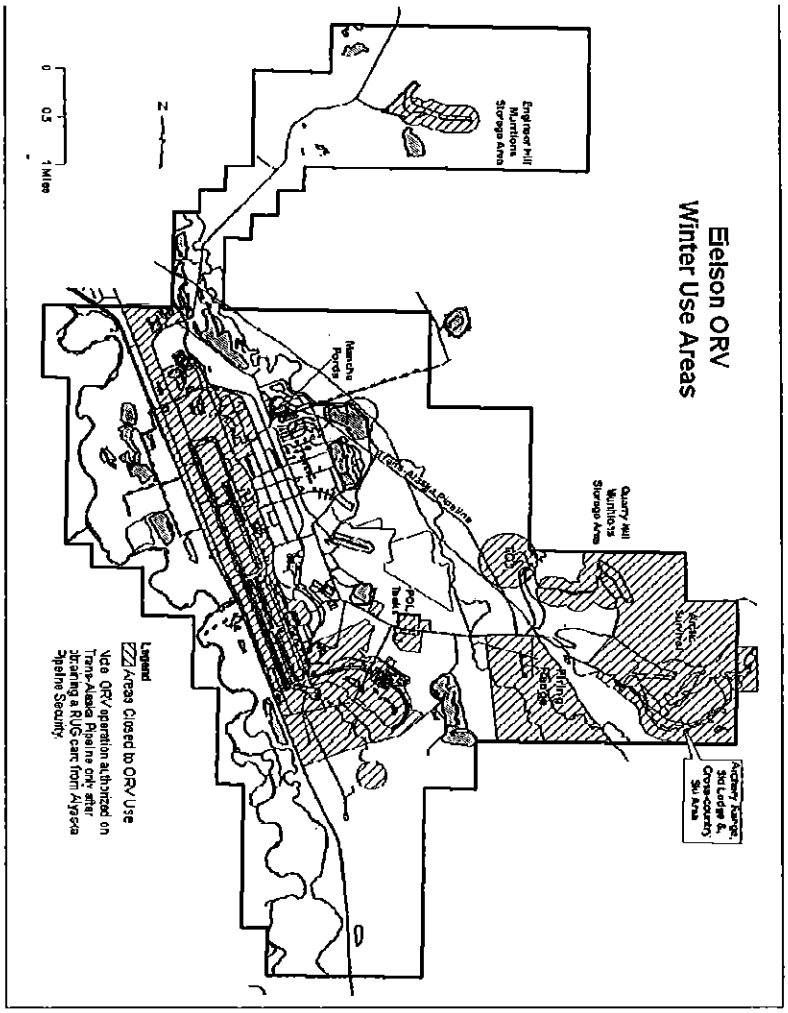
Attachment 3

EIELSON ORV, SUMMER USE AREAS



Attachment 4

EIELSON ORV, WINTER USE AREAS



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APPENDIX B
AIR QUALITY

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

$\mu g/m^3$	Micrograms Per Cubic Meter
ACAM	Air Conformity Applicability Model
AESO	Aircraft Environmental Support Office
AGL	Above Ground Level
CAA	Clean Air Act
CO	Carbon Monoxide
CY	Calendar Year
ETS/CEM	Emission Tracking System/Continuous Emissions Monitoring
FHWA	Federal Highway Administration
FRIES	Fast Rope Insertion/Extraction System
GRSQF	Gross Square Feet
HAPS	Hazardous Air Pollutants
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEW	Net Explosive Weight
NO_x	Nitrogen Oxides
PM_{10}	Particulate Matter with a diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate Matter with a diameter less than or equal to 2.5 microns
ppm	Parts per Million
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RAPIDS	Rapid Infiltration/Exfiltration
ROI	Region of Influence
SER	Significant Emissions Rate
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compounds

Air Quality

This appendix presents an overview of the Clean Air Act (CAA) and the state of Tennessee air quality program. The appendix also discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections.

Air Quality Program Overview

In order to protect public health and welfare, the U.S. Environmental Protection Agency (USEPA) has developed numerical concentration-based standards or National Ambient Air Quality Standards (NAAQS) for six "criteria" pollutants (based on health-related criteria) under the provisions of the Clean Air Act Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (GPO, no date).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Division of Air Pollution Control under the Tennessee Department of Environment and Conservation (TDEC) is the state authority that administers Tennessee's air pollution control program.

Tennessee adopted the federal NAAQS, except that Tennessee maintains the annual PM_{10} standard (Table B-1). Also, no standard was stated for $PM_{2.5}$ and 8-hour ozone, in which case the state must adhere to federal standards.

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment), worse than (nonattainment) the NAAQS, and unclassifiable. Those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas. Maintenance areas are those areas that were previously classified as nonattainment but have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state are in compliance with the NAAQS.

TABLE B-1
SUMMARY OF NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Criteria Pollutant	*Averaging Time*	*Federal Primary NAAQS (8)*	*Federal Secondary NAAQS (8)*	*Tennessee 1° Standards*	*Tennessee 2° Standards*
Carbon Monoxide (CO)	8-hour(1)	9 ppm (10 mg/m^3)	No standard	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1-hour(1)	35 ppm (40 mg/m^3)	No standard	35 ppm (40 mg/m^3)	35 ppm (40 mg/m^3)
Lead (Pb)	Quarterly	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)	0.05 ppm (100 µg/m^3)
Particulate Matter ≤10 Micrometers (PM_{10})	Annual(2)	Revoked	Revoked	50 µg/m^3	50 µg/m^3
	24-hour(3)	150 µg/m^3	150 µg/m^3	150 µg/m^3	150 µg/m^3
Particulate Matter <2.5 Micrometers ($PM_{2.5}$)	Annual(4)	15 µg/m^3	15 µg/m^3	No standard	No standard
	24-hour(5)	35µg/m^3	35 µg/m^3		
Ozone (O_3)	1-hour(7)	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)
	8-hour(6)	.075 ppm (2008 std) (157 µg/m^3)	No Standard	No standard	No standard
Sulfur Dioxide (SO_2)	Annual	0.03 ppm (80 µg/m^3)	No standard	0.03 ppm (80 µg/m^3)	No standard
	24-hour(1)	0.14 ppm (365 µg/m^3)	No standard	0.14 ppm (365 µg/m^3)	No standard
	3-hour(1)	No standard	0.50 ppm (1300 µg/m^3)	No standard	0.50 ppm (1300 µg/m^3)

Source: USEPA, 2008 (Federal Standards)
TDEC, 2006a (Tennessee Standards)
CO = carbon monoxide; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; NAAQS= National Ambient Air Quality Standards; NO_x NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; $PM_{2.5 \text{ or } 10}$ = particulate matter less than or equal to 2.5 or 10 microns, respectively, in diameter; ppm = parts per million; SO_2 = sulfur dioxide; tpy = tons per year

General conformity analysis is required if the action's direct and indirect emissions have a potential to emit (PTE) one or more of the six criteria pollutants at or above emission rates shown in Table B-2 or Table B-3 or if the action's direct and indirect emissions of any criteria pollutant represent 10 percent of a nonattainment or maintenance area's total emissions inventory for that pollutant.

TABLE B-2
EMISSION RATES FOR CRITERIA POLLUTANTS IN NONATTAINMENT AREAS*
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Pollutant		*Emission Rate (tpy)*
Ozone (VOCs or NO_x)		
	Serious nonattainment areas	50
	Severe nonattainment areas	25
	Extreme nonattainment areas	10
	Other ozone nonattainment areas outside an ozone transport region	100
Marginal and moderate nonattainment areas inside an ozone transport region		
	VOC	50
	NO_x	100
CO: All nonattainment areas		100
SO_2 or NO_2: All nonattainment areas		100
PM_{10}		
	Moderate nonattainment areas	100
	Serious nonattainment areas	70
$PM_{2.5}$		
	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb: All nonattainment areas		25

Source: USEPA, 2006
**De minimus* threshold levels for conformity applicability analysis.

TABLE B-3
EMISSION RATES FOR CRITERIA POLLUTANTS IN ATTAINMENT (MAINTENANCE) AREAS*
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Pollutant		*Emission Rate (tpy)*
Ozone (NO_x, SO_2 or NO_2): All maintenance areas:		100
Ozone (VOCs)		
	Maintenance areas inside an ozone transport region	50
	Maintenance areas outside an ozone transport region	100
CO: All maintenance areas		100
PM_{10}: All maintenance areas		100
$PM_{2.5}$		
	Direct Emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb: All maintenance areas		25

Source: USEPA, 2006
**De minimus* threshold levels for conformity applicability analysis.

Each state is required to develop a state implementation plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds: 100 or 250 tons per year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. Table B-4 provides a list of the PSD significant emissions rate (SER) thresholds for selected criteria pollutants (USEPA, 1990).

TABLE B-4
CRITERIA POLLUTANT SIGNIFICANT EMISSIONS RATE THRESHOLDS UNDER PSD REGULATIONS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Pollutant	*Significant Emissions Rate (tons/year)*
PM_{10}	15
$PM_{2.5}$	10
Total Suspended Particulate (TSP)	25
SO_2	40
NO_x	40
Ozone (VOC)	40
CO	100

Source: Title 40 CFR Part 51.166

The goals of the PSD program are to: (1) ensure economic growth while preserving existing air quality, (2) protect public health and welfare from adverse effects that might occur even at pollutant levels better than the NAAQS, and (3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in Table B-5. National parks and

wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. The areas surrounding Eglin Air Force Base and Hurlburt Field are classified as Class II. Currently there are no designated Class III areas in the United States.

TABLE B-5
FEDERAL ALLOWABLE POLLUTANT CONCENTRATION INCREASES UNDER PSD REGULATIONS
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Pollutant	Averaging Time	Maximum Allowable Concentration ($\mu g/m^3$)		
		Class I	Class II	Class III
PM_{10}	Annual	4	17	34
	24-hour	8	30	60
SO_2	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO_2	Annual	2.5	25	50

Source: Title 40 CFR Part 51

Tennessee has a statewide air quality-monitoring network that is operated by both state and local environmental programs (TDEC, 2006b). Tennessee monitors for ozone and PM_{10} and $PM_{2.5}$. The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards. Also included are areas where the ambient standards are being met but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end result of that attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in that process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

Tennessee monitors air quality with a few monitors distributed around the state along with four local air pollution control agencies in Chattanooga, Knoxville, Memphis, and Nashville. The 8-hour ozone and 1-hour ozone threshold has been exceeded during the years of record. Despite the exceedances in Tennessee, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard.

Regulatory Comparisons

In order to evaluate the air emissions and their impact to the overall region of influence (ROI), the emissions associated with the construction activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 National Emissions Inventory (NEI) data (USEPA, 2002). Potential impacts to air quality were then identified as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10-percent criterion approach is used in the General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. Although the county considered in the analysis is an attainment area for the NAAQS, the General Conformity Rule's impact analysis was utilized to provide a consistent approach to evaluating the impact of the Proposed Action's emissions.

To provide a conservative evaluation, the impacts screening in this analysis used a more restrictive criteria than required in the General Conformity Rule. Rather than comparing emissions from construction activities to regional inventories (as required in the General Conformity Rule), emissions were compared to the individual county potentially impacted, which is a smaller area.

Project Calculations

Construction Emissions

Construction emissions calculations were completed using the calculation methodologies described in the U.S. Air Force Air Conformity Applicability Model (ACAM). As previously indicated, a conformity determination is not required since the county considered in the analysis is designated "attainment;" the ACAM was used to provide a level of consistency with respect to emissions factors and calculations.

The ACAM evaluates the individual emissions from different sources associated with the construction phases. These sources include grading activities, asphalt paving, construction worker trips, stationary equipment (e.g., saws and generators), nonresidential architectural coatings, and mobile equipment emissions (U.S. Air Force, 2003a).

It was assumed that the 14.4 acres for the motocross course, 10,000-square-foot parking area, and 5 miles (assumed a maximum of 10 feet in width) of all-terrain vehicle (ATV) trails would require some grading or land clearing. Operational emissions from the types of vehicles were calculated using emission factors from the *Air Force IERA, Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations* (U.S. Air Force, 2003b). Based on these assumptions, the construction emissions were calculated using the calculation methodology expressed below.

Grading Activities

Grading activities are divided into grading equipment emissions and grading operation emissions. Grading equipment calculations are combustive emissions from equipment engines and are ascertained in the following manner.

$VOC = 0.22$ (lbs/acre/day) * Acres * DPY_1 / 2000

$NO_x = 2.07$ (lbs/acre/day) * Acres * DPY_1 / 2000

$PM_{10} = 0.17$ (lbs/acre/day) * Acres * DPY_1 / 2000

$CO = 0.55$ (lbs/acre/day) * Acres * DPY_1 / 2000

$SO_2 = 0.21$ (lbs/acre/day) * Acres * DPY_1 / 2000

Where Acres = number of gross acres to be graded during Phase I construction.

DPY_1 = number of days per year during Phase I construction that are used for grading.

2000 = conversion factor from pounds to tons.

All emissions are represented as tons per year.

Grading operations are calculated using a similar equation from the Sacramento Air Quality Management District and the South Coast Air Quality Management Districts (Sacramento Metropolitan Air Quality Management District, 1994). These calculations include grading and truck hauling emissions.

PM_{10} (tons/yr) =60.7 (lbs/acre/day) * Acres * DPY_1 / 2000

Where Acres = number of gross acres to be graded during Phase1 construction.

DPY_1 = number of days per year during Phase I construction that are used for grading.

2000 = conversion factor from pounds to tons.

Calculations assumed that there were no controls used to reduce fugitive emissions. Also, it was assumed that construction activities would occur within 365 days and grading activities would represent a total of 21 acres. Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (Sacramento Metropolitan Air Quality Management District, 1994).

Off-Highway Vehicles

The emission factors for the off-road motorcycles, ATVs, and minibikes were obtained from the *Air Force IERA Air Emissions Inventory Guidance Document for Mobile Sources* (U.S. Air Force, 2003b). Using the emission factors and the assumed hours of utilization

(Table B-6), emissions were calculated. This was achieved by multiplying the emission factor by the annual hours of use and converted to tons.

TABLE B-6
HOURS OF OPERATIONAL USE
Establishment of an OHV Program at Arnold Air Force Base, Tennessee

Utilization Rate	Percent Range		Hours	Units
Low Utilization	35%	≤	596	hours/year
Moderate Utilization	35%	>	596	hours/year
	60%	≤	1022	hours/year
High Utilization	60%	>	1022	hours/year
	100%	≤	1704	hours/year

≤ - less than or equal to; > - greater than

National Emissions Inventory

The NEI is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous state and local air agencies, from tribes, and from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country on a yearly basis. The NEI includes emission estimates for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county level estimates for area, mobile, and other sources, are available currently for 1996 and 1999 for criteria pollutants and HAPs.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database.

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_x)
- Sulfur Dioxide (SO_2)
- Particulate Matter (PM_{10} and $PM_{2.5}$)

The NEI also includes emissions of volatile organic compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with nitrogen oxides in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources.

- Point Sources - Stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or more) of at least one criteria pollutant and must be inventoried and

reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.

- Area Sources - Small point sources such as a home or office building, or a diffuse stationary source such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example, i.e., a single dry cleaner within an inventory area typically will not qualify as a point source, but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile Sources - Any kind of vehicle or equipment with a gasoline or diesel engine; airplane; or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units: USEPA's Emission Tracking System/Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources: state data and older inventories where state data was not submitted.
- For on-road mobile sources: the Federal Highway Administration's (FHWA's) estimate of vehicle miles traveled and emission factors from USEPA's MOBILE Model.
- For nonroad mobile sources: USEPA's NONROAD Model.
- For stationary area sources: state data, USEPA-developed estimates for some sources, and older inventories where state or USEPA data was not submitted.
- State and local environmental agencies supply most of the point source data. USEPA's Clean Air Market program supplies emissions data for electric power plants.

References

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APPENDIX C
PUBLIC/AGENCY INVOLVEMENT

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Notice of Intent to Sign
A Finding of No Significant Impact
(Off-Highway Vehicle Program Arnold Engineering Development Center)

A Draft Finding of No Significant Impact (FONSI) has been prepared in accordance with 32 Code of Federal Regulation Part 989- Environmental Impact Analysis Process and the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 United States Code Sections 4321 - 4347). NEPA mandates that federal entities consider and document environmental effects of all proposed actions. The Proposed Action is for Arnold AFB to establish an OHV riding program with a riding area north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding consisting of berms and jumps. An approximately 10,000 square foot gravel parking and loading/unloading area for the users would also be developed.

The Draft FONSI documents that there has been a conscious identification and evaluation of the proposed action, alternative to the proposed action, and a no-action alternative to determine that there would be no significant impact on the human or natural environment. The identification and evaluation of the alternatives were accomplished through the preparation of an Environmental Assessment (EA).

The Draft FONSI and EA are available for public review and comment. Copies of the Draft FONSI and EA are available by contacting Arnold Air Force Base Public Affairs at 931-454-4204. Comments may be submitted in writing to the following address:

704th CES/CEA
ATTN: Richard McWhite, FONSI/EA Comments
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

It is the intent of the Air Force to sign the FONSI no earlier than 28 April 2010.

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Wildlife Resources Agency (TWRA)
Mr. Dan Sherry
TWRA NEPA Contact
Box 40747
Nashville, TN 37204

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

1. We are pleased to provide you the Draft EA for the establishment of an OHV Program at Arnold Air Force Base (AFB), TN. The Proposed Action is for Arnold AFB to establish an OHV riding program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding consisting of berms and jumps. An approximately 10,000 square foot gravel parking and loading/unloading area for the users would also be developed. At this time, exact trail locations have not been determined; the EA serves to evaluate the proposed area and provide suitability ratings for the area based various resources and associated limitations constraints. The entire proposed OHV area and motocross area has been evaluated to identify locations that may be suitable for OHV trail development and use. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system. An alternative to the Proposed Action is to develop the motocross area only.

2. This document is provided in compliance with the regulations of the President's Council on Environmental Quality implementing the National Environmental Policy Act. Comments on the Draft EA are requested within 30 days from the date on this memorandum.

3. Please send comments and questions to:

704th CES/CEA
ATTN: Richard McWhite, FONSI/EA Comments
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

1 Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Department of Environment and Conservation (TDEC) Historical Commission
Mr. E. Patrick McIntyre, Jr.
Attention: Mr. Joe Garrison, Historical Reviews
Mr. Mike Moore, Archaeological Reviews
Clover Bottom Mansion
2941 Lebanon Rd.
Nashville, TN 37243-0442

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

1. We are pleased to provide you the Draft EA for the establishment of an OHV Program at Arnold Air Force Base (AFB), TN. The Proposed Action is for Arnold AFB to establish an OHV riding program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding consisting of berms and jumps. An approximately 10,000 square foot gravel parking and loading/unloading area for the users would also be developed. At this time, exact trail locations have not been determined; the EA serves to evaluate the proposed area and provide suitability ratings for the area based various resources and associated limitations constraints. The entire proposed OHV area and motocross area has been evaluated to identify locations that may be suitable for OHV trail development and use. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system. An alternative to the Proposed Action is to develop the motocross area only.

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704th CES/CEA
ATTN: Richard McWhite, FONSI/EA Comments
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

1 Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Department of Environment and Conservation (TDEC)
Ms. Anne Marshall
TDEC NEPA Contact
Division of Natural Heritage
7th Floor L&C Tower
401 Church Street
Nashville, TN 37243

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

1. We are pleased to provide you the Draft EA for the establishment of an OHV Program at Arnold Air Force Base (AFB), TN. The Proposed Action is for Arnold AFB to establish an OHV riding program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding consisting of berms and jumps. An approximately 10,000 square foot gravel parking and loading/unloading area for the users would also be developed. At this time, exact trail locations have not been determined; the EA serves to evaluate the proposed area and provide suitability ratings for the area based various resources and associated limitations constraints. The entire proposed OHV area and motocross area has been evaluated to identify locations that may be suitable for OHV trail development and use. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system. An alternative to the Proposed Action is to develop the motocross area only.

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ATTN: Richard McWhite, FONSI/EA Comments
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

1 Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Department of Environment and Conservation (TDEC)
Mr. Gerald Parish
TDEC NEPA Contact
Division of Recreation Services
10th Floor L&C Tower
401 Church Street
Nashville, TN 37243

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

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100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

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DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Department of Environment and Conservation (TDEC)
Mr. Barry Stephens
TDEC NEPA Contact
Division of Air Pollution Control
9th Floor L&C Tower
401 Church Street
Nashville, TN 37243

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

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100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

1 Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: TN Department of Environment and Conservation (TDEC)
Mr. Paul Davis
TDEC NEPA Contact
Division of Water Pollution Control
6th Floor L&C Tower
401 Church Street
Nashville, TN 37243

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

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Richard McWhite
Arnold AFB Natural Resources Manager

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DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: Mr. Alan Leiserson, Staff Coordinator
Dep. of Environment and Conservation, Office of General Counsel
20th Floor L&C Tower
401 Church Street
Nashville, TN 37243

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

SUBJECT: Environmental Assessment (EA) for Off-Highway Vehicle (OHV) Program at Arnold Engineering Development Center

1. We are pleased to provide you the Draft EA for the establishment of an OHV Program at Arnold Air Force Base (AFB), TN. The Proposed Action is for Arnold AFB to establish an OHV riding program. The proposed location is north of Wattendorf Highway and just west of the AEDC cantonment area within the fenced portion of Arnold AFB. The OHV riding area would be approximately 715 acres and would consist of several miles of OHV riding trails and a small area (approximately 15 acres) set aside for motocross riding consisting of berms and jumps. An approximately 10,000 square foot gravel parking and loading/unloading area for the users would also be developed. At this time, exact trail locations have not been determined; the EA serves to evaluate the proposed area and provide suitability ratings for the area based various resources and associated limitations constraints. The entire proposed OHV area and motocross area has been evaluated to identify locations that may be suitable for OHV trail development and use. Based on the analysis of the proposed area with respect to environmental constraints and consideration of potential impacts, Arnold AFB would identify a suitable low-impact trail system. An alternative to the Proposed Action is to develop the motocross area only.

2. This document is provided in compliance with the regulations of the President's Council on Environmental Quality implementing the National Environmental Policy Act. Comments on the Draft EA are requested within 30 days from the date on this memorandum.

3. Please send comments and questions to:

704th CES/CEA
ATTN: Richard McWhite, FONSI/EA Comments
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

Richard McWhite
Arnold AFB Natural Resources Manager

1 Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
Arnold Engineering and Development Center

Date: 24 March 2010

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS, AND ORGANIZATIONS

TO: Mary Jennings
Field Supervisor
Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

FROM: 704th CES/CEA
100 Kindel Drive, Suite B307
Arnold AFB, TN 37389-2307

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