PROGRAMMATIC ENVIRONMENTAL ASSESSMENT
FOR
Fielding of the ARMORED MULTI-PURPOSE VEHICLE

PREPARED FOR DEPARTMENT OF ARMY, DEPUTY CHIEF OF STAFF, G-9

PREPARED BY U.S. ARMY ENVIRONMENTAL COMMAND

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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR ARMORED MULTI-PURPOSE VEHICLE (AMPV) FIELDING AND STATIONING

DECEMBER 2022

Reviewed and Approved by the U.S. Army Environmental Command

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20-Dec-2022

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Colonel, U.S. Army
Commanding

date

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ACRONYMS

§	Section
AAP	Army Alternate Procedures
ABCT	Armored Brigade Combat Team
AC	Active Component
ACHP	Advisory Council on Historic Preservation
ACP	access control point
ACUB	Army Compatible Use Buffer
ADP	Area Development Plan
AIRFA	American Indian Religious Freedom Act
AMPV	Armored Multi-Purpose Vehicle
AMS	Army Modernization Strategy
AR	Army Regulation
ARNG	United States Army National Guard
ARPA	Archaeological Resources Protection Act
ASI	Additional Skill Identifier
AT/FP	Antiterrorism/Force Protection
BCT	Brigade Combat Team
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CFR	Code of Federal Regulations
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CO_2e	carbon dioxide equivalent
CUP	Compatible Use Plan
CWA	Clean Water Act
CX	Categorical Exclusion
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DMPRC	Digital Multi-Purpose Range Complex
DMPTR	Digital Multi-Purpose Training Range
DoD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
ESQD	explosives safety quantity distance
FONSI	Finding of No Significant Impact
FoV	Family of Vehicles
FY	fiscal year
GHG	greenhouse gas
GIS	Geographical Information System
HAP	hazardous air pollutant
HEL Soils	highly erodible land soils
HPC	Historic Property Component
HQDA	Headquarters, Department of the Army
HQ IMCOM	Headquarters, United States Army Installation Management Command
HVAC	heating, ventilation, and air conditioning
IBCT	Infantry Brigade Combat Team
ICRMP	Integrated Cultural Resources Management Plan
IMCOM	United States Army Installation Management Command

INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
ISCP	Installation Spill Contingency Plan
ISMP	Invasive Species Management Plan
ITAM	Integrated Training Area Management
JBLM-YTC	Joint Base Lewis McChord-Yakima Training Area
JBSA	Joint Base San Antonio
JBSA-FSH	Joint Base San Antonio-Fort Sam Houston
JLUS	Joint Land Use Study
LCEA	Lifecyle Environmental Analysis
LEED	Leadership in Energy and Environmental Design
MBTA	Migratory Bird Treaty Act
MDO	Multi-Domain Operations
MEC	munitions and explosives of concern
MIM	Maneuver Impact Mile
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MOS	Military Occupation Specialty
MOU	Memorandum of Understanding
MPRC-H	Multi-Purpose Range Complex - Heavy
NAAQS	National Ambient Air Quality Standard
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPTEMPO	Operational Tempo
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PEA	Programmatic Environmental Assessment
PEO	Program Executive Office
PEO GCS	Program Executive Office Ground Combat Systems
psi	pounds per square inch
RC	Reserve Component
RCMP	Range Complex Master Plan
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	region of influence
RONA	record of non-applicability
SPCCP	Spill Prevention Control and Countermeasure Plan
sf	square feet
SOP	standard operating procedure
TADSS	Training Aids, Devices, Simulators, and Simulations
TRADOC	U.S. Army Training and Doctrine Command
U.S.	United States
USAG	United States Army Garrison
USAR	United States Army Reserve
USC	United States Code
VCF	vehicle conversion factor
VSF	vehicle severity factor

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1.0. PURPOSE, NEED, AND SCOPE

1.1. Introduction and Regulatory Authority

The United States (U.S.) Army has developed this Programmatic Environmental Assessment (PEA) to analyze the environmental and socioeconomic impacts associated with the proposed stationing and fielding of the Armored Multi-Purpose Vehicle (AMPV) to appropriate Active Component (AC) and Reserve Component (RC) Army units and National Guard units (referred to as "installations" in this document), to include subsequently operating and maintaining these vehicles in support of Army training and mission requirements. This PEA, along with a draft Finding of No Significant Impact (FONSI), has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA) (Title 42 of the United States Code [USC] Section [§] 4321 *et seq.*), the President's Council on Environmental Quality (CEQ) NEPA implementing regulation (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Army's NEPA implementing regulation, *Environmental Analysis of Army Actions* (32 CFR Part 651).

In April 2022, the Council on Environmental Quality (CEQ) issued this final rule to update its regulations for Federal agencies to implement the National Environmental Policy Act (NEPA). This final rule comprehensively updates, modernizes, and clarifies the regulations to facilitate more efficient, effective, and timely NEPA reviews. The changes went into effect on 20 May 2022. As such, this analysis will follow this updated rule.

Army units and installations are also guided by other relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental compliance, to include natural and cultural resources management and planning. Many of these authorities are addressed in various sections throughout this PEA when relevant to environmental resources and conditions.

1.2. Background

Threats to Army combat vehicles are growing rapidly. Combat vehicles across the world are nearing or surpassing parity with the U.S. In 2019, the U.S. Army issued the Army Modernization Strategy (AMS) that describes how it will transform into a multi-domain force by 2035 (https://www.army.mil/e2/downloads/rv7/2019_army_modernization_strategy_final.pdf). The Army will meet its enduring responsibility as part of the Joint Force (all U.S. and allied military forces) to provide for the defense of the U.S. and retain its position as the globally dominant land power. The primary end state of the 2019 AMS is a modernized Army capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force in one major action by 2028, and ready to conduct MDO across an array of scenarios in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force (Army, Navy, Air Force, Marines, and Space Force) in the rapid and continuous integration of all domains of warfare – land, sea, air, space, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fails.

In support of the AMS, the Army has six modernization priorities driving materiel development for the MDO capable force:

- Long Range Precision Fires
- Next Generation Combat Vehicles
- Future Vertical Lift
- Network Technology
- Air and Missile Defense
- Soldier Lethality

Both the Army's AC and RC support the Army's capability of conducting MDO. The AC consists of soldiers who are in the Army as their full-time occupation. The RC, which includes both the Army National Guard (ARNG) and U.S. Army Reserve (USAR), is composed primarily of soldiers who serve part-time but who can be ordered to full-time duty.

The M113 Armoured Personnel Carrier (M113) was first adopted by the Army in 1960. The M113 variants account for approximately 30% of the Armored Brigade Combat Teams' (ABCTs) tracked vehicle fleet. The M113 was the first mass produced combat vehicle designed as personnel carriers that were thick enough to protect soldiers and passengers against small arms fire but light enough that it could be transported via air. In 2007, the U.S. stopped buying the M113 and worked to identify, develop, and acquire a replacement. The M113 has been replaced as front-line combat vehicles by the M2 and M3 Bradley Family of Vehicles (FoV) but are still widely used in support roles (e.g., ambulance, engineer vehicle, or command vehicle). The replacement of the M113 armored personnel carrier has been identified as the AMPV (PdM, July 2020). In replacing the M113 with the AMPV, the demolition and demilitarization of the M113 may include scrapping the personnel carrier for parts, refurbished for use outside of its current use, or put up for sale within the U.S. and to other countries after appropriate demilitarization is undertaken. Specific plans for the individual M113 carriers being replaced are currently unknown and are assumed to occur on a case-by-case basis at each installation, since the variants at each location differ, and the motor pool area will also fluctuate between installations.

For the purpose of this PEA, it is assumed that the operations associated with using the AMPV would closely resemble the M113 it replaces, in terms of number of hours, miles and operation, as well as the distribution of those hours and miles during on-road or off-road operations.

The AMPV is an armored, turretless, tracked vehicle which will provide a platform with sufficient protection, mobility, and network enabled functionality to maneuver with and support combat vehicles throughout the range of military operations. "The AMPV is basically the standard M2 Bradley, minus the gun turret [*sic*] plus multiple automotive protection upgrades" (Federation of Scientists, 2020). See **Figure 1** for a comparison of the M113 to the AMPV.

Figure 1: AMPV Relative Size Compared to M113

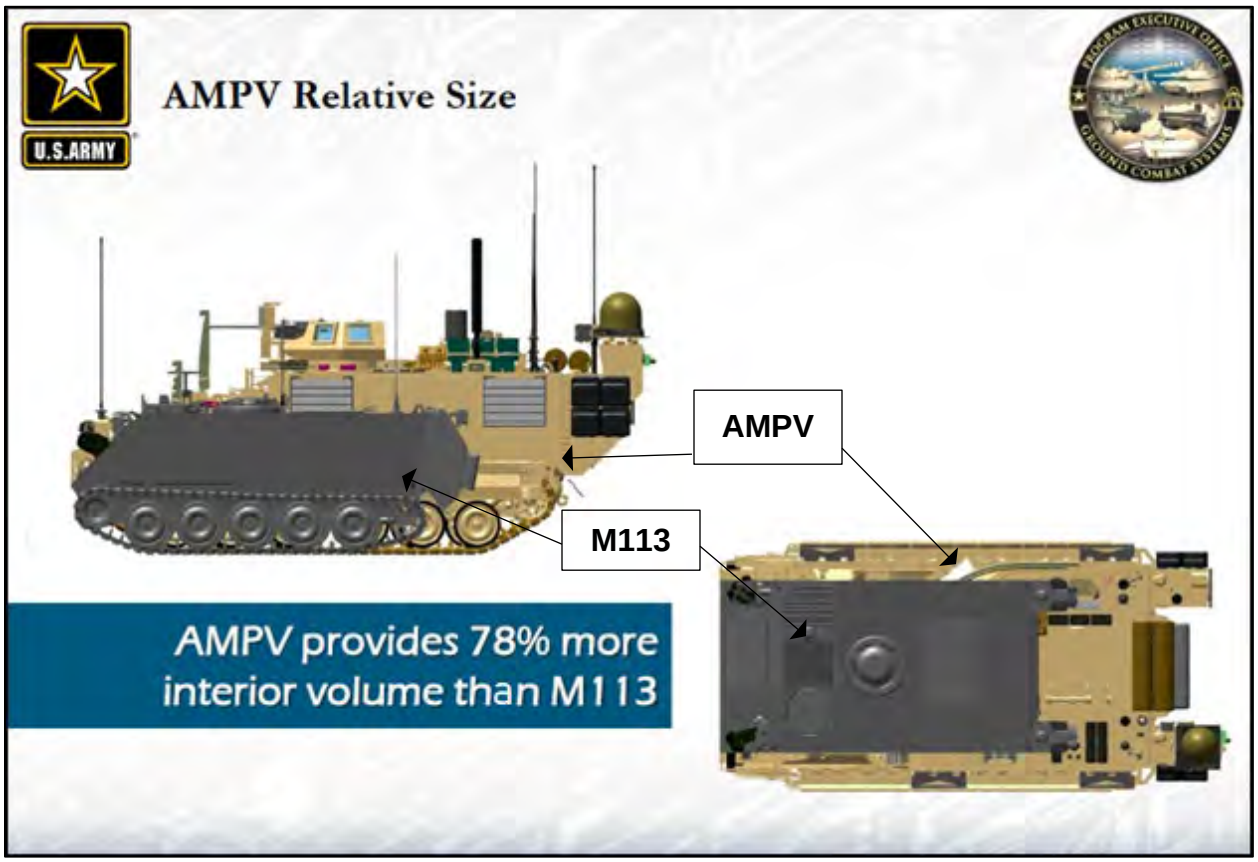


Figure 1 Source: breakingdefense.com

The recovery vehicle for the M113 and the AMPV is the M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES) improved Recovery Vehicle. Since 1961, the HERCULES has been the primary 70-ton recovery system. The stability and performance are unmatched by any alternate tank-based design. Use of this vehicle is ongoing, no change to the equipment or frequency of use is anticipated, and no change is anticipated to the impact on the environment (BAE Systems, n.d.).

1.3. Purpose of the Proposed Action

The purpose of the Army's proposed action is to establish stationing and fielding locations of the AMPV variants to replace the M113 armored personnel carriers in order to train the Army's AC and RC ABCTs and other units at Army installations in the U.S., consistent with the AMS. The AMPV is identified as the core capability to support Military Joint Forces across a range of military operations conducted in a wide range of terrains and environments.

1.4. Need for the Proposed Action

The Army needs to replace the M113 with the AMPV to improve the safety and survivability of soldiers and provide for improved integrated network capability and

interoperability across the spectrum of combat vehicle mission roles. The M113 has remained in Army formations as an armored tracked vehicle with variants that consist of a general personnel carrier, a mobile command post, a medical treatment vehicle, an ambulance, and a mortar carrier. The AMPV variants have demonstrated that they are superior to the M113 in meeting the Army's stated needs. The M113 variants will be replaced with specific AMPV variants, which are described further in Section 2.2. Proposed Action and Alternatives. See **Table 1** below for a comparison of the M113 variant versus the coordinating AMPV variant.

Table 1: M113 and AMPV Variant Roles

M113 Variant	AMPV Variant	Primary Role
M113A3 Armored Personnel Carrier Vehicle	General Purpose (GP)	Provides armored transport for supplies and troops.
M1068 and M577A3 Command Post Carrier Vehicle	Mission Command (MCmd)	Mobile command units; can use multiple to make large, central working area near the front.
M577A3 Medical Treatment Vehicle	Medical Treatment (MT)	Treats wounded troops as close as possible to the front line; mobile protected environment for a unit surgeon and medical staff.
M113A3 Armored Medical Evacuation Vehicle	Medical Evacuation (ME)	Evacuates troops under fire.
M1064 Mortar Carrier Vehicle	Mortar Carrier (MC)	Provides on-call fire support to frontline units.

Source: AMPV LCEA and FONSI, PdM July 2020

1.5. Scope of the Analysis

This PEA evaluates potential direct, indirect, and cumulative effects of the Proposed Action and Alternatives, to include the no action Alternative, in accordance with CEQ and 32 CFR Part 651. This information is also intended to determine whether potential impacts to the human environment would be significant and determine whether mitigation would be appropriate for the potential impacts. Per the Army's NEPA regulation, the environmental analysis within this PEA is proportionate to the nature and scope of the action, the complexity and level of anticipated effects on important resources, and the capacity of Army decisions to influence those effects in a productive, meaningful way from the standpoint of environmental quality.

This PEA incorporates by reference the analysis contained in the 2020 *Armored Multi-Purpose Vehicle (AMPV) Life Cycle Environmental Assessment (LCEA) and Finding of No Significant Impact (FONSI)* prepared by Product Manager (PdM), Armored Multi-

Purpose Vehicle, signed by MG Bryan P. Cummings on Sept. 8, 2020 (PdM, July 2020), located in **Appendix B**.

The AMPV will replace the M113 at AC and RC units that are authorized for the M113. The total number of M113 to be replaced by AMPV variants is approximately 2,000-3,000 vehicles (PdM, July 2020). The Army proposes to begin fielding the AMPV in fiscal year 2023 (Defense News). This PEA includes installation-specific analysis in addition to general analyses that would be applicable to most of the proposed installations. This PEA document is written as an overview for the fielding of the AMPV system, which may or may not require additional NEPA analysis at individual installations. If the consideration and analyses in this PEA are applicable to local conditions and if no additional issues are identified, requirements of NEPA can be met using this PEA and the completion of a specific Record of Environmental Consideration (REC). Consistent with 32 CFR Part 651.19, a REC can be used for the installations discussed in this PEA, if the analysis fully addressed the proposed action and was sufficient to determine the environmental impacts. An Environmental Checklist is included in **Appendix A**.

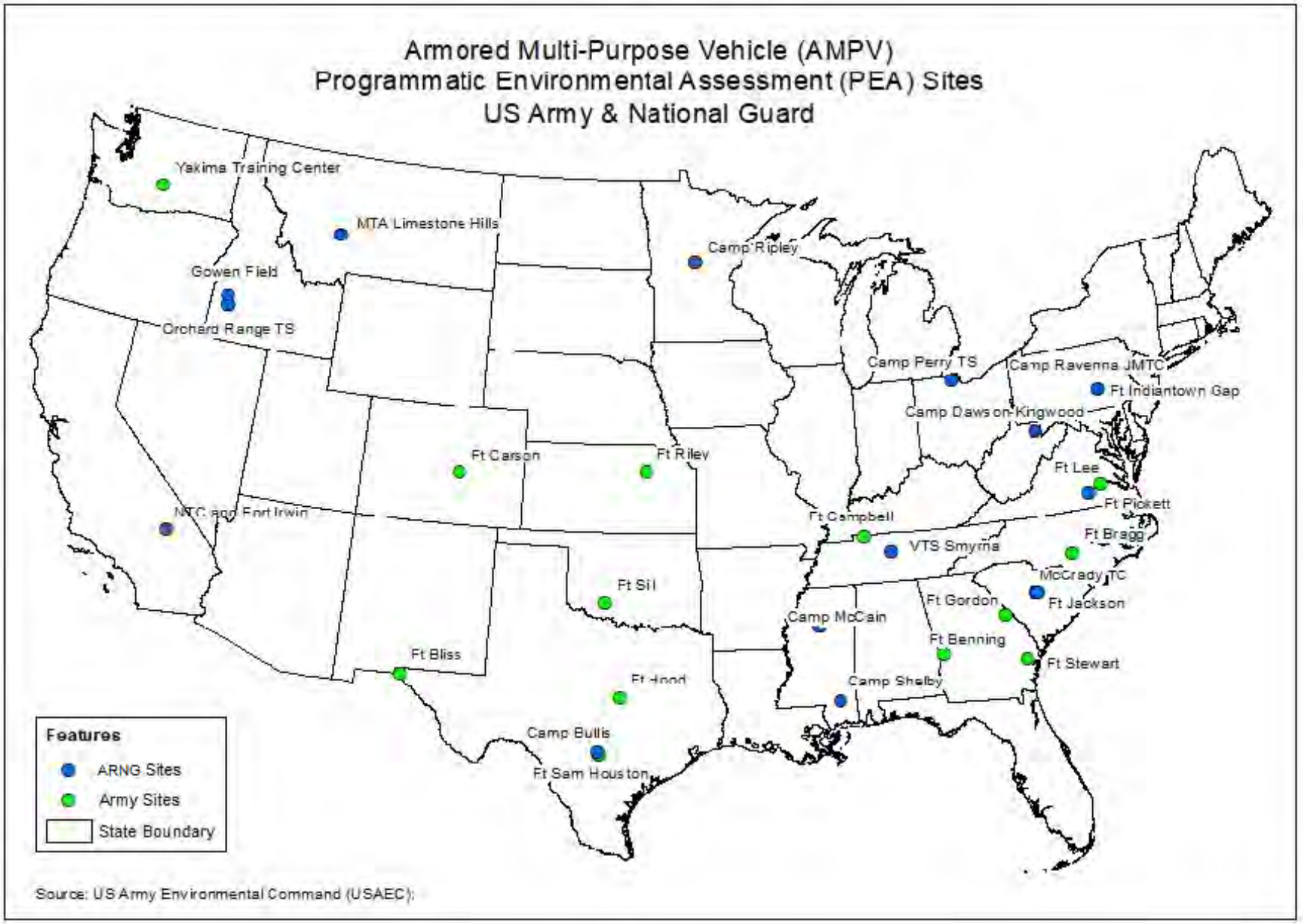
If specific information at a receiving installation regarding the stationing, fielding, training, and maintenance of this capability is not currently available for adequate analysis of the potential environmental effects discussed in this PEA prior to implementing the fielding decision, tiering by adopting this PEA and preparing an abbreviated EA is most appropriate. In addition, tiering from this PEA can be done for installations that are not discussed in this document should the mission and needs of the Army require fielding this capability to other installations. The PEA Environmental Checklist can be used as a tool to determine whether tiering is needed.

At installations receiving the AMPV, this PEA will facilitate compliance with the Army's NEPA regulations (32 CFR Part 651 Environmental Analysis of Army Actions) by providing (1) a framework to address the impacts of this type of action, (2) a procedure to certify a complete understanding for all impacts addressed in this PEA through the use of the installation-specific REC, and (3) a procedure to facilitate the preparation of a focused, tiered, or (abbreviated) supplemental NEPA document when the need is identified. Installations considered for the stationing and fielding of the AMPV are shown in **Figure 2**.

1.6. Public and Agency Involvement

In accordance with 32 CFR Part 651, the Army provides opportunities for the public and agencies to participate in the NEPA process to promote open communication and improve the decision-making process. Persons and organizations having potential interest in the Proposed Action are encouraged to participate in the PEA process.

Figure 2: Potential Installations Considered



A notice of availability (NOA) was published in December 2022 in the *Federal Register* announcing a 30-day public review and comment period for this PEA and the draft FONSI. Direct mailings to inform Native American Tribes of the NOA publication were issued to those affiliated with each of the assessed installations.

An electronic copy of the PEA and draft FONSI is available for download from the U.S. Army Environmental Command's website at *https://aec.army.mil/index.php?cID=352*.

Please send electronic comments via email to *usarmy.jbsa.imcom-aec.mbx.nepa@army.mil* or mail written comments to*:*

U.S. Army Environmental Command
2455 Reynolds Road, Bldg. 2266
ATTN: Public Comments
Joint Base San Antonio-Fort Sam Houston, TX 78234-7588

If you have questions or are unable to access the PEA or Draft FONSI on the internet, please contact the U.S. Army Environmental Command Public Affairs Office at 210-466-1590 or 210-466-1655 or send email to: usarmy.jbsa.imcom-aec.mbx.public-mailbox@army.mil for assistance. Comments submitted within the 30-day public comment period will be made part of the Administrative Record and will be considered before a final decision is made.

1.7. Decision to Be Made

This NEPA process will end with an Army decision documented in a FONSI or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). Prior to making a final decision, the decision-maker will consider environmental and socioeconomic impacts, along with any required mitigation measures, and all other relevant information, such as public issues of concern identified during the comment period. If the decision-maker determines that there are no significant environmental impacts as a result of fielding and stationing the AMPV at the proposed installations, the decision will be documented in the final FONSI, which will be signed no earlier than 30 days from the publication of the NOA for this PEA and the draft FONSI. The Army may initiate a NOI for an EIS if new information warrants the need for additional analysis of potentially significant environmental impacts. The Army decision-makers for this PEA is the Department of Army's Deputies Chief of Staff, G-9, and G-3/5/7.

2.0. PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action and Alternatives. The Proposed Action and those alternatives carried forward for analysis have all been determined to meet the purpose of and need for the Proposed Action, as described in Sections 1.3 and 1.4 respectively.

2.1. Screening Criteria

The Army used screening criteria to assess whether an alternative was reasonable and would be carried forward for evaluation in this PEA. The Army established screening criteria to identify the range of potential alternatives that would support the purpose of

and need for the Proposed Action. Reasonable alternatives must meet the following three criteria:

- **M113 Variants Authorized for Use by Assigned Units –** Installations must have units that are currently authorized one or more M113 variants or the installation provides initial or collective training for M113 assigned soldiers. Most M113 variants are assigned to multiple types of companies and batteries within ABCTs, though there are a few installations in the Army which have a M113 variant assigned to other types of units.
- **Maneuver Space** – Adequate maneuver space is available to units proposed for AMPV fielding to support the minimum requirements for AMPV training, as designated in authoritative Army training documents. However, institutional and/or base training sites would not require the full amount of maneuver space as student training would provide basic abilities that will be honed at the battalion level.
- **Live-Fire Capability** – Adequate live-fire ranges are available to support the minimum requirements for AMPV crew certification and training, as designated in authoritative Army training documents. Institutional and/or base training sites, however, would not require the full complement of live-fire ranges as student training will provide basic abilities that will be honed at the battalion level. Weapons used on the AMPV system are all common weapons found in the Army system, including the M249, M240, M2 or MK19, and the 120 mm mortar.

Cantonment area support facilities are not included as screening criteria for this Proposed Action and Alternatives for the following reasons:

- The AMPV is a one-for-one replacement of the M113. In general, there would be no change in total number of soldiers nor soldiers' Military Occupation Specialties (MOSs) or Additional Skill Identifiers (ASIs). No change is anticipated in administrative, housing, and personnel support space requirements; therefore, no additional construction is anticipated.
- Assignment of maintenance and motor pool facilities are based on BCT configuration and not individual vehicles. As M113 squads/sections are primarily in ABCTs which already include large and heavy tanks, such as the M1 Abrams series tanks and M2/M3 Bradley Fighting Vehicle (Bradley) series infantry/scout vehicles, no change is anticipated in maintenance and motor pool facility requirements.

Table 2 provides a list of installations that meet the above screening criteria. This table may not represent an all-inclusive list. It also identifies whether the installation real property is managed by U.S. Army Installation Management Command (IMCOM), ARNG, USAR, or other DoD Services. **Table 3** shows armored vehicles and artillery usage by individual installations, and what training areas they have available as well.

Table 2: Potential Installations Considered for Proposed AMPV Fielding

	Installation	Real Property Management Entity
1	Fort Benning, Georgia	IMCOM
2	Fort Bliss, Texas	IMCOM
3	Fort Bragg, North Carolina	IMCOM
4	Fort Campbell, Kentucky	IMCOM
5	Fort Carson, Colorado	IMCOM
6	Fort Gordon, Georgia	IMCOM
7	Fort Hood, Texas	IMCOM
8	Fort Irwin, California	IMCOM
9	Fort Jackson, South Carolina	IMCOM
10	Fort Lee, Virginia	IMCOM
11	Fort Riley, Kansas	IMCOM
12	Fort Sill, Oklahoma	IMCOM
13	Fort Stewart, Georgia	IMCOM
14	Joint Base Lewis McChord - Yakima Training Center (JBLM – YTC), Washington	IMCOM
15	Joint Base San Antonio - Fort Sam Houston (JBSA-FSH) / Camp Bullis, Texas (Army Support Activity)	USAF
16	Camp Dawson-Kingwood, West Virginia	ARNG
17	Camp James A. Garfield Joint Military Training Center (JMTC), Ohio	ARNG
18	Camp McCain, Mississippi	ARNG
19	Camp Perry Joint Training Center (JTC), Ohio	ARNG
20	Camp Ripley, Minnesota	ARNG
21	Camp Shelby, Mississippi	ARNG
22	Fort Indiantown Gap, Pennsylvania	ARNG
23	Fort Pickett, Virginia	ARNG
24	Gowen Field, Idaho	ARNG
25	McCrady Training Center, South Carolina	ARNG
26	MTA Limestone Hills, Montana	ARNG
27	Orchard Combat Training Center, Idaho	ARNG
28	Volunteer Training Site - Smyrna, Tennessee	ARNG

Real Property Management Entity	Installation / Site Name	M1 Abrams Tank	Bradleys	M113	Artillery	Remarks
IMCOM	Fort Benning, GA	Yes	Yes	Yes	Yes	Heavy Maneuver Area, DMPTC, M1/Bradley Ranges
IMCOM	Fort Bliss, TX	Yes	Yes	Yes	Yes	Heavy Maneuver Area, MPRC-H, DMPTR, DMPRC
IMCOM	Fort Bragg, NC	No	No	Unk	Yes	Heavy Maneuver, Light artillery
IMCOM	Fort Campbell, KY	No	No	Unk	Yes	Light Artillery
IMCOM	Fort Carson, CO	Yes	Yes	Yes	Yes	Heavy Maneuver Areas, DMPTR
IMCOM	Fort Gordon, GA	No	No	Unk	No	Light Maneuver Areas
IMCOM	Fort Hood, TX	Yes	Yes	Yes	Yes	Heavy Maneuver Area, DMPRC, DMPTR
IMCOM	Fort Jackson, SC	Unk	Unk	Unk	Unk	Heavy Maneuver Areas, Tank / Bradley Stationary NG
IMCOM	Fort Lee, VA	No	No	No	No	Light Maneuver Areas
IMCOM	Fort Riley, KS	Yes	Yes	Yes	Yes	Heavy Maneuver Area, DMPRC, DMPTR
IMCOM	Fort Sill, OK	No	No	Yes	Yes	Heavy Maneuver Area Artillery track vehicles
IMCOM	Fort Stewart, GA	Yes	Yes	Yes	Yes	Heavy Maneuver Area, DMPRC, DMPTR
IMCOM	Joint Base Lewis McChord - Yakima Training Center	Yes	Yes	Yes	Yes	Heavy Maneuver Area
USAF	Joint Base San Antonio - Fort Sam Houston	No	No	No	No	Training Area Camp Bullis

Real Property Management Entity	Installation / Site Name	M1 Abrams Tank	Bradleys	M113	Artillery	Remarks
USAF	JBSA-Camp Bullis, TX (Army Support Activity)	No	No	Yes	No	Light and Heavy Maneuver Areas
ARNG	Camp Dawson-Kingwood, WV	Unk	Yes	Yes	No	Light Maneuver Area
ARNG	Camp McCain, MS	Yes	Yes	Yes	Yes	Heavy Maneuver Areas Available
ARNG	Camp Orchard, ID	Yes	Yes	Yes	Yes	Heavy Maneuver Area, MPTR
ARNG	Camp Perry, OH	Unk	Unk	Unk	Unk	Light Maneuver Area
ARNG	Camp Ravenna, OH	Unk	Unk	Unk	Unk	Light Maneuver Area
ARNG	Camp Ripley, MN	Yes	Yes	Yes	No	Heavy Maneuver Area, MPTR
ARNG	Camp Shelby, MS	Yes	Yes	Yes	No	Heavy Maneuver Area, MPTR
ARNG	Fort Indiantown Gap, PA	Yes	Yes	Yes	No	Heavy Maneuver Area, No MPTR
ARNG	Fort Pickett,VA	Yes	Yes	Yes	No	Heavy Maneuver Area, MPTR
ARNG	Gowen Field, ID	No	No	No	No	Near Boise Airfield
ARNG	McCrady Training Center,SC	Yes	Yes	Yes	No	Heavy Maneuver Area, Tank Range
ARNG	MTA Limestone Hills, MT	Yes	Yes	Yes	Unk	Heavy Maneuver Area, MPTR
ARNG	Volunteer Training Site - Smyrna, TN	Unk	Yes	Yes	Unk	Heavy Maneuver Area

2.2. Proposed Action and Alternatives

The Proposed Action is to field the AMPV to replace five mission roles currently provided by the M113, to include associated operational activities, soldier training, and AMPV maintenance activities. The AMPV is an armored, tracked vehicle which will provide a platform with sufficient protection, mobility, and network enabled function to maneuver with and support combat vehicles throughout the range of military operations. To support the five mission roles, the AMPV has different variants, including the General Purpose, Mission Command, Medical Treatment, Medical Evacuation, and Mortar Carrier vehicles (**Figure 3**).

Figure 3. AMPV Family of Vehicles and Mission Roles

Graphic source: Freedberg, 2019

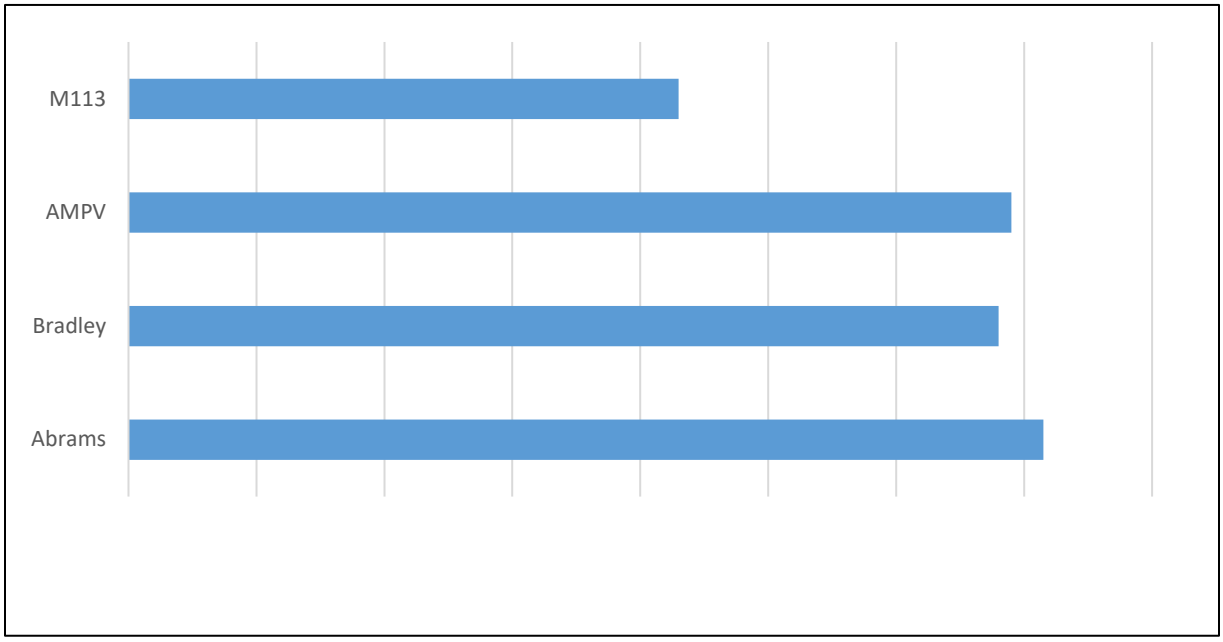
The General Purpose variant is for resupply, casualty evacuation, and security for medical evacuation; the Mission Command variant includes communications equipment and network systems; the Medical Treatment variant provides a "mobile protected environment" for a unit surgeon and medical staff; the Medical Evacuation variant is an ambulance version; and the Mortar Variant provides mortar fire support to ABCT teams.

These AMPV variants would replace the following M113 variants: M113A3 (General Purpose), M1068 and M577A3 (Mission Command), M577A3 (Medical Treatment), M113A3 (Medical Evacuation), and M1064 (120mm Mortar Carrier).

As with the M113, the AMPV would operate on- and off-road, with off-road terrain located in a variety of ecosystems. Travel between the motor pools and training areas would use tank trails and paved roads that meet weight restrictions. The AMPV has approximately one-third more ground pressure (**Figure 4**) and is a larger and heavier vehicle than the M113 (**Figure 5**), however weight and ground pressure of the AMPV is similar to the currently fielded Bradley, which are already located at most of the 28-proposed installations. Both are substantially lighter than the M1 Abrams, a tank that is also assigned to ABCTs and is part of ABCT training missions. Projected AMPV annual usage rates for the AC and RC combined total are approximately 3,500 miles among the five variants, which is similar to other combat vehicles currently in the field. There is no extraordinary characteristic of the AMPV either in weight or dimensions that make it likely to contribute to excessive wear of drive surfaces (PdM, July 2020). Training range requirements would be the same as ranges used for M113 training. As these ranges are also used by Bradley fighting vehicles, improvements to hard stand are not anticipated to be required. The expected total requirement for all AMPV maneuver training in one year would be approximately the same area required for M113 maneuver training.

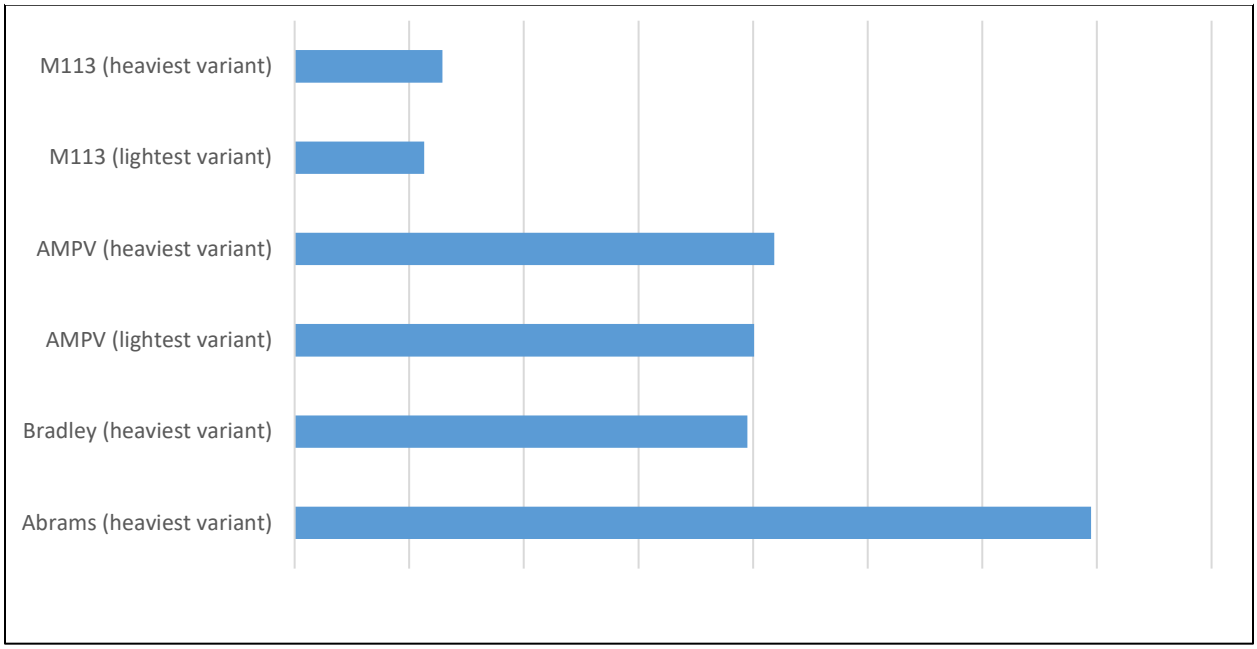
The AMPV variants would host standard Army weapons already in use.

Figure 4. Relative Ground Pressure of Select U.S. Army Tracked Vehicles



*Units of measurement removed for OPSEC

Figure 5. Relative Weights of Select U.S. Army Tracked Vehicles



*Units of measurement removed for OPSEC

Replacement of all applicable M113 vehicles with the appropriate AMPV variant would, however, expect to span 10 or more years. The current production level plans of the AMPV do not meet replacement of the M113 before 2030. During the transitional phase, when both the M113 and the AMPV will need to be stored at the installation, there may be a need for greater storage of both types of tracked vehicles. This would occur on a case-by-case basis at each installation and could occur without significant impact. Construction of additional storage units, if necessary, could occur on previously disturbed soil, or no more than five cumulative acres of surface disturbance to undisturbed land, as stated in Categorical Exclusion (c)(1) Construction and Demolition (a REC would be required). If the work does not fit within this Categorical Exclusion (CX), then additional NEPA review may be required by that specific installation.

2.2.1. No Action Alternative

Under the no action alternative, the AMPV would not be fielded; Army units would continue to use the M113 even though the M113 is no longer able to incorporate useful modifications, the U.S. stopped buying the M113 in 2007, soldier safety and survivability needs would not be addressed, and integrated network capability as well as interoperability improvements would not be realized. The no action alternative is included in accordance with CEQ regulations to provide a baseline against which to compare the impacts of any action alternatives (40 CFR § 1502.14(d)).

2.2.2. Action Alternative: Field AMPV Units to Replace M113

Under the action alternative, the Army would field AMPV units to installations to replace, on a one-to-one ratio, the equivalent mission roles currently fulfilled by M113 variants. Though minor adjustments in the variant mix may occur, ABCT structures and

manpower would remain largely unchanged as a result of AMPV fielding. Approximately 130 vehicles of an M113 variant are fielded to each ABCT.

2.2.3. Alternatives Considered but Eliminated from This Study

No other alternatives were considered in this analysis as the AMPV is a replacement of the M113. Separate NEPA analysis addressed AMPV development within the AMPV LCEA and FONSI included three additional Alternatives but were excluded from further review because they did not meet the required performance, cost, or schedule constraints of the program (PdM, July 2020).

3.0. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

This section discusses aspects of the environment that may be impacted by implementation of the Proposed Action and Alternatives. The development of the AMPV was analyzed in the AMPV LCEA (PdM, July 2020), included in **Appendix B,** and concluded there were insignificant or minimal impacts to the environment from the development of the AMPV as a replacement of the M113. An analysis of potential impacts is provided for the implementation of that replacement in this fielding and stationing action, and plans already in place, best management practices, and mitigation measures are identified.

3.1. Approach for Analyzing Impacts and Identifying Mitigation

For analysis, the resources have been categorized to enable a managed and systematic approach; a region of influence (ROI) is identified for each resource.

The analysis for each resource considers numerous factors when determining impact conclusions. Significance thresholds are defined for each resource to determine if identified impacts would significantly affect the human environment. The analysis considers whether these effects are reasonably foreseeable and have a reasonably close causal relationship to the Proposed Action or Alternatives.

Section 3 describes the resources analyzed, and addresses direct, indirect, and cumulative impacts for each resource that the proposed action may have on the environment. Quantitative and qualitative analyses have been used to determine if a threshold would be exceeded. Based on the results of these analyses, this PEA identifies if a potential impact would be adverse or beneficial and characterizes the severity as one of the following:

- Negligible – An environmental impact could occur, but the impact might not be perceptible.
- Minor – A perceptible environmental impact that would not be significant.
- Moderate / Less than Significant – An environmental impact could occur, is readily detectable, but is less than significant. Following standard procedures, best management practices (BMPs), or applying precautionary measures to minimize adverse impacts may be required. Moderate / less than significant adverse impacts would not exceed significance thresholds or violate applicable local, state, or federal regulations.

- Significant but Mitigable – A significant impact is anticipated, but the Army can implement management actions or other mitigation measures to reduce the adverse impacts to less than significant.
- Significant – An environmental impact which, given the context and intensity, violates or exceeds regulatory or policy standards, would substantially alter the function or character of the resource, or otherwise exceed the identified threshold.

Mitigation measures, to include avoidance, BMPs, and standard operating procedures (SOPs), are environmental protection measures that would, per 32 CFR Part 651.15(a) definitions, avoid, minimize, rectify, reduce, eliminate, or compensate for the adverse impact of the Proposed Action.

3.1.1. Resources Requiring Limited Analysis

The weight and size difference between the M113 and the AMPV are what lead to the differential effects within maneuver areas and driving between the cantonment and training areas (PdM, July 2020). The differences in effects are likely to result in less than significant impacts to the corresponding resource areas. The resources requiring limited analysis to identify and disclose environmental impacts and any appropriate mitigations are:

- Air quality
- Geological and soil resources
- Water resources
- Biological resources
- Cultural resources
- Transportation and traffic

This decision to limit the analysis to these resources is based on the following:

- the AMPV is to be a one-for-one replacement of the M113;
- no or minimal changes to personnel numbers are anticipated as a result of fielding;
- no or minimal changes are anticipated in facility requirements as a result of fielding;
- the weapons proposed to be hosted on one or more of the AMPV are standard Army weapons already in use; and,
- the AMPV LCEA (PdM, July 2020) concluded insignificant or minimal impacts to the above specified resources.

As the operational tempo (OPTEMPO) of training is based on mission requirements, the analysis assumes AMPV training OPTEMPO is the same as the M113 training OPTEMPO.

3.1.2. Resources Not Requiring Further Analysis

As the AMPV is a replacement system for the M113, and all fielding, stationing, and training activities will result in comparably similar or negligible additional environmental

impacts to the M113, the following resources are not analyzed in this PEA, for the following existing reasons:

- Land use – The AMPV will be used on existing test courses and ranges on installations that already have similar tracked vehicles. No new track roads or testing facilities are planned to be constructed, and no additional land development, rearrangement, or terrain modification is expected to be needed to field the AMPV. The AMPV would travel to training areas from existing motor pools on paved roads that meet weight restrictions.
- Noise – The AMPV will not exhibit sufficient sound levels to create an annoyance, harm, or noise pollution to environments, ecosystems, and communities beyond that of the testing, training, or fielding sites that already exist on installations that have tracked vehicles.
- Hazardous and toxic materials and waste – Draining of vehicle fluids will occur at regular intervals, conducted in a maintenance bay or garage with proper handling and storage of POLs exists. If an accidental spill occurs, the installation will follow their Spill Prevention Control and Countermeasure Plans (SPCCP), Installation Spill Contingency Plans (ISCP), and other SOPs to address clean-up, storage, and disposal. Any refrigerant or fire suppressant that evacuates from the AMPV system will be reclaimed for reuse or disposed of, following EPA regulations. If primer or topcoat paint removal is required, maintenance personnel will follow SOPs to collect, handle, store and dispose of the removed coating materials, and will be done in a well-ventilated area. No unique, new, or additional waste streams of materials hazardous to human health or the environment will be generated.
- Human health and safety – Fielding and stationing activities for the AMPV will not have an adverse effect on human health or safety. All training activities will be completed following existing Range and training area protocols.
- Utilities – The AMPV will have no impact to existing utilities.
- Airspace – The AMPV will not impact any airspace as a tracked vehicle. Training exercises will occur on ranges that already exist.
- Electromagnetic spectrum – The AMPV does not emit electromagnetic radiation.
- Socioeconomics and Environmental Justice – Fielding the AMPV will not result in any disproportionately high or adverse human health and environmental effects on minority or low-income populations. There are no Executive Order 12898 Environmental Justice concerns for this action.

These resources do not result in any significant additional impact when considering that the AMPV will replace the M113 on a one-to-one basis.

3.2. Typical Army Installation Environment

Army units are all assigned various mission-specific roles which, cumulatively, support the Army mission to deploy, fight, and win our Nation’s wars by providing ready, prompt, and sustained land dominance by Army forces across the full spectrum of conflict as part of the Joint Force. Army installations deliver base support for active and reserve component use to enable readiness for our globally responsive Army. This base support is executed in a manner that enables environmental sustainment and compliance so the

Army can continue to meet its training mission. The following section describes components of a typical Army installation, and the environmental resources that are examined in this PEA at each installation. This PEA provides programmatic-level discussion of resources analyzed and the potential impacts anticipated from implementation of the Proposed Action and Alternatives, regardless of the unique characteristics of individual installations. Where installation-specific issues require additional discussion, the subsequent sections discuss those issues that are unique or specific to installations identified in **Table 1**.

3.2.1. Background

3.2.1.1. Existing Plans Relevant to the Proposed Action and/or Resources Analyzed

Numerous Army regulations guide the management of environmental resources on Army installations, to include directing installations to have select management plans to ensure the applicable resources are managed in a deliberate, thoughtful, and consistent manner. The AMPV LCEA and FONSI (PdM, July 2020) stated that impacts related to the lifecycle of the AMPV as a replacement to the M113 were determined to be minimal.

Plans that typically guide the management of environmental resources on Army installations and are relevant within one or more of the resource ROIs, to include resources not specifically analyzed within this PEA, include:

- Real property master plan
- Range complex master plan
- Integrated natural resources management plan
- Integrated cultural resources management plan
- Integrated pest management plan
- Integrated Training Area Management Program plan
- Storm water pollution prevention plan
- Fugitive dust control plan
- Erosion control plan
- Health and safety plan
- Spill prevention, control, and countermeasures plan
- Noise management plan
- Wildfire management plan

For this analysis, a records review was completed to determine if the affected installations have environmental resource management plans/programs in place to ensure mitigation of impacts caused by fielding the AMPV in place of the M113.

Table 3: Plans and Program Addressing Environmental Impacts of Military Maneuvers

Installation	Integrated Cultural Resource Management Plan (ICRMP)	Integrated Natural Resource Management Plan (INRMP)	Integrated Training Area Management (ITAM) Program Plan
Fort Benning, GA	Y	Y	Y
Fort Bliss, TX	Y	Y, Draft	Y
Fort Bragg, NC	Y	Y	Y
Fort Campbell, KY	Y	Y	Y
Fort Carson, CO	Y	Y	Y
Fort Gordon, GA	Y	Y	Y
Fort Hood, TX	Y	Y	Y
Fort Irwin, CA	Y	Y	Y
Fort Jackson, SC	Y	Y	Y
Fort Lee, VA	Y	Y	Y
Fort Riley, KS	Y	Y	Y
Fort Sill, OK	Y	Y	Y
Fort Stewart, GA	Y	Y	Y
JBLM - YTC, WA	Y	Y	Y
JBSA - FSH / Camp Bullis, TX	Y	Y	**Y*** - Draft under review
Camp Dawson-Kingwood, WV	Y	**Y***	Y
Camp James A. Garfield JMTC, OH	Y	**Y*** – Draft under review	Y
Camp McCain, MS	Y	Y	Y
OCTC, ID	**Y***	**Y***	Y
Camp Perry JTC, OH	Y	N	Y
Camp Ripley, MN	Y	Y	Y
Camp Shelby, MS	Y	Y	Y
Fort Indiantown Gap, PA	Y	Y	Y
Fort Pickett, VA	**Y*** – Draft under review	Y	Y

Installation	Integrated Cultural Resource Management Plan (ICRMP)	Integrated Natural Resource Management Plan (INRMP)	Integrated Training Area Management (ITAM) Program Plan
Gowen Field, ID	**Y***	**Y***	Y
McCrady Training Center, SC	Y	**Y***	Y
MTA Limestone Hills, MT	Y	**Y***	Y
VTS, Smyrna, TN	Y	Y	Y

Y* - indicates that the plan is greater than 5 years out-of-date but may continue to be accurate and useful. Not all out-of-date plans are identified.

3.2.1.2. Maneuver Training and the Army's Sustainable Range Program

Army maneuver training lands support each installation's mission to help maintain the operational readiness of AC and RC units. In addition to operational training within ABCTs and other units, maneuver training areas also support U.S. Army Training and Doctrine Command (TRADOC) programs of instruction. TRADOC school commandants develop and approve maneuver training area requirements that their respective schools need to support training classes.

Off-road vehicle training within maneuver areas may impact environmental resources to varying degrees based upon vehicle parameters and local environmental conditions. This training may result in minimal to moderate impacts to soil compaction, soil erosion, fugitive dust (airborne dust), water quality degradation, biological resources, and cultural resources. As these lands are critical for maintaining operational readiness, Army Regulation (AR) 350-19, *The Army Sustainable Range Program*, assigns responsibilities to ensure the Army can maximize the capability, availability, and accessibility of ranges and training lands to support doctrinal requirements, mobilization, and deployments under normal and surge conditions (DA, 2005).

Within the Sustainable Range Program is a core program titled the Integrated Training Area Management (ITAM) Program. It provides Army range officers and land managers the capability to manage and maintain training land by integrating mission requirements with environmental requirements and sound land management practices. All the currently proposed installations have ITAM Programs; however, because this is a programmatic environmental assessment and the proposed list is notional, some future affected installations may not. In instances where an installation does not have an active ITAM Program, the sustainability requirements of AR 350-19 still apply to all Army training lands. Mitigation measures are put in place, when possible, to ensure environmental resources are minimally impacted by training activities. In addition, rehabilitation and maintenance activities are carried out to ensure the sustainable use of Army training lands. A few examples of these sustainment activities are provided in **Appendix C**. Land rehabilitation and maintenance is a key enabler for sustaining realistic training conditions and supporting the personnel, weapons, vehicles, and the mission requirements for the units using the installation.

The ITAM Program is a core component of the Sustainable Range Program (SRP) and includes responsibility for maintaining training land to help the Army meet its training requirements. To accomplish this mission, ITAM relies on its five components explained below. The purpose of the ITAM Program components is to integrate mission requirements with environmental management practices. These ITAM components establish the policies and procedures to achieve sustainable use of training and testing lands.

- Land Rehabilitation and Maintenance (LRAM). LRAM is the primary program for repair and rehabilitation of training lands within ITAM. LRAM uses land management practices and support from Range and Training Land Assessment (RTLA) to enhance safety and training value of the land by minimizing adverse impacts through rehabilitation and maintenance.
- Range and Training Land Assessment (RTLA). RTLA acquires data and assesses information to track the capability and sustainability of the land to support mission activities. RTLA data is used to identify LRAM projects, ensure that biological considerations are part of the LRAM project prioritization process, determine the effectiveness of LRAM projects, and recommend training load distribution for land so that the sustainability of the training land can be maintained.
- Sustainable Range Awareness (SRA). SRA provides a proactive means to develop and distribute educational materials with procedures to reduce the potential for inflicting avoidable impacts on range and training land during military training.
- SRP Geographical Information System (SRP GIS). The SRP GIS mission is to create, analyze, manage, and distribute authoritative standardized spatial information, products, and services for the execution of training strategies and missions on U.S. Army ranges and training lands. SRP GIS provides geospatial data and analysis to support land management decisions and training mission geospatial products.
- Training Requirements Integration (TRI). TRI facilitates achieving mission goals through decision support and coordinating training needs with other installation plans. This provides information and analysis to assist with range and training land planning, scheduling, maintenance, and modernization. Information is obtained from SRP GIS, RTLA, LRAM, and appropriate installation offices. The analysis considers environmental compliance requirements, range facilities' requirements, and landscape condition requirements in the development of range and training land management decisions. This includes the integration of Range Complex Master Plan mission goals and objectives into the INRMP and its subordinate plans. TRI is a continual collaboration with the installation range office, trainers/users of training lands, and state and federal agencies.

Through the integration of sound land management practices, the Army seeks to use scientifically proven practices while executing land rehabilitation and maintenance priorities within budgetary constraints.

Table 4: Potential Effects to Soil and Vegetation from Military Maneuvers

Activity/Use	Potential Effects on: Natural Resources	Training/Combat Readiness
Vehicles operated off-road	Degradation of soil, water, and vegetation	Loss of training realism
	Erosion gullies	Safety hazards in eroded areas
	Soil compaction	Contamination of soils could limit availability of training areas
	Soil and water contamination from field maintenance	Increased maintenance costs
Foxholes Defilades	Soil displacement	Loss of training realism
	Erosion; eroded soils unable to support vegetation	Safety hazards in eroded areas
Bivouac areas	Soil compaction and/or erosion	Loss of training realism
	Loss of vegetation understory and overstory	Loss of camouflaging for vehicles and troop locations
		Limit usable training areas
Range firing	Soil compaction, erosion, and inversion	Immobilized vehicles mired in mud
	Loss of vegetation understory and overstory	Loss of training realism
		Potential administrative restrictions as a result of disturbance to Federally protected species or habitat
	Wildfires from pyrotechnics, tracer ammunition, or shell detonation	Accidental fires result in loss of usable training areas
	Artillery training produces a heavy metals residue	May result in administrative restrictions

(Fort Hood, 2019)

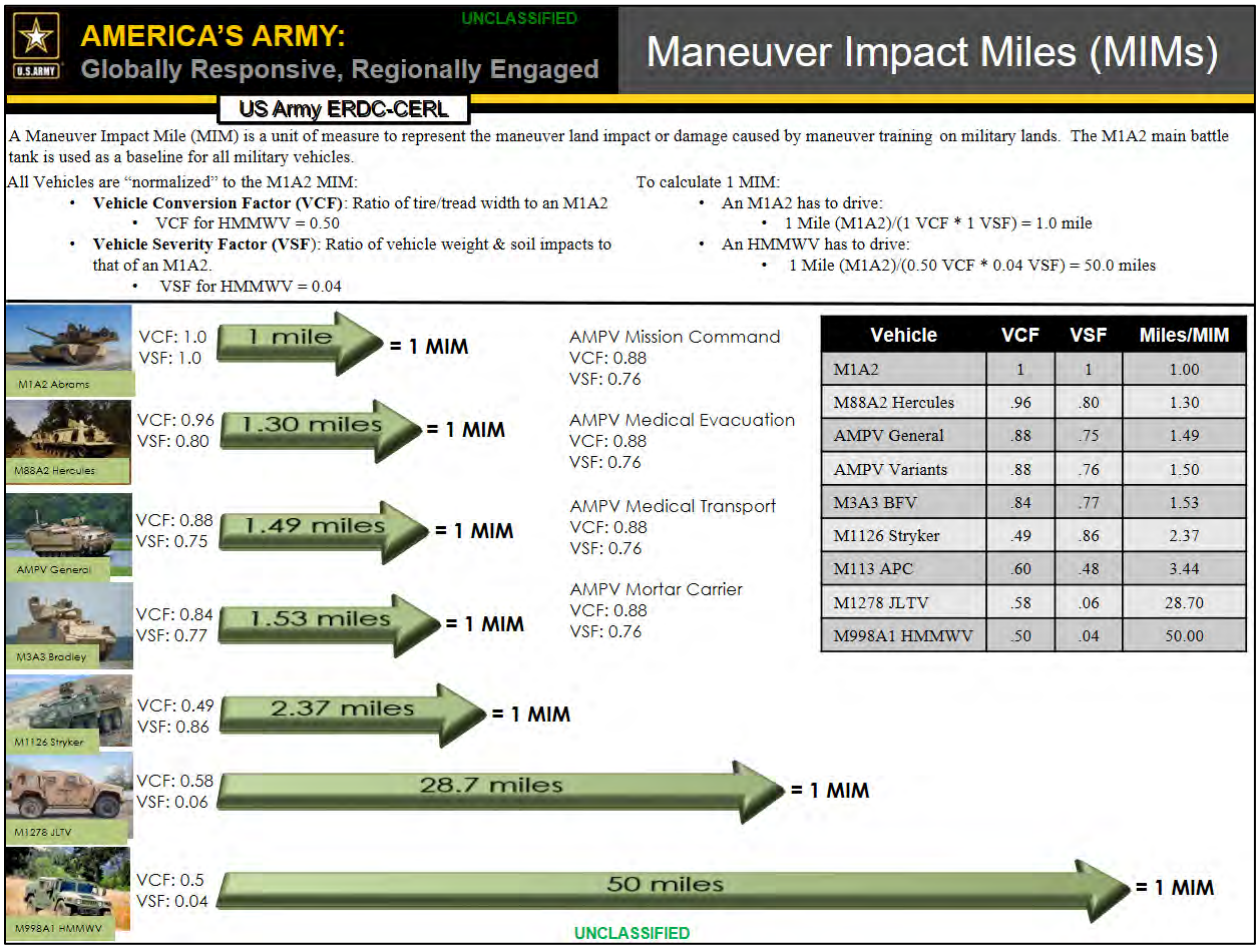
3.2.1.3. Maneuver Impact Miles (MIMs)

The Army measures maneuver impacts on the land by applying training event mileage to vehicle track or wheel specifications. This helps determine the footprint on the ground, and then considers the weight to determine impact to the soil, using the M1A2 Abrams Main Battle Tank as a baseline for all military vehicles. **Figure 6** shows how MIMs are calculated as well as the comparative values for military vehicles to include the M113, AMPV, and M88A2 (recovery vehicle). The M88A2 Hercules is currently used as the recovery vehicle for the M113 and will continue to be used for the AMPV. No

change to the equipment or frequency of use is anticipated. Utilizing this comparative tool, installations can determine if any net increase in damage to soil is anticipated.

MIMs enable the Army to project the funds necessary for repairing potential maneuver damage. This funding allows installations to plan (before training occurs) for rehabilitation and managing maneuver/training damage.

Figure 6: Description of Maneuver Impact Miles (MIMs)



Vehicle	VCF	VSF	Miles/MIM
M1A2	1	1	1.00
M88A2 Hercules	.96	.80	1.30
AMPV General	.88	.75	1.49
AMPV Variants	.88	.76	1.50
M3A3 BFV	.84	.77	1.53
M1126 Stryker	.49	.86	2.37
M113 APC	.60	.48	3.44
M1278 JLTV	.58	.06	28.70
M998A1 HMMWV	.50	.04	50.00

Source: US Army ERDC-CERL, 2020

As an example, M3A3 Bradley Fighting Vehicles (approximately 39.5 tons) are lighter vehicles than the M1A2 Abrams tank (approximately 69.5 tons) and therefore use less MIMs per mile driven. The Bradley's vehicle conversion factor (VCF) is 0.84, and its vehicle severity factor (VSF) is 0.77. Similarly, the Bradley can travel 1.53 miles and have the same maneuver impact as an M1 Abrams driving one mile. The MIMs that would result from AMPV training (1.49 miles) is similar to that of the Bradley; see **Figure 6.**

3.2.2 Air Quality

Air quality is regulated by the EPA and states per the Clean Air Act (CAA; 42 USC § 7401 *et seq.*). The CAA established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare and to regulate emissions of hazardous air pollutants.

The NAAQS established ambient air quality regions. Air quality at a given location is a function of several factors, both naturally occurring and manmade, including the quantity and type of pollutants emitted locally and regionally, as well as the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, presence or absence of inversions, and topography.

The air quality analysis within this PEA is limited to fugitive dust generated within maneuver training areas and from tank trails; see section 3.1.1. As such, the ROI for this resource's analysis within this PEA is the air shed and installation boundary for regulated particulate matter.

3.2.2.1. Affected Environment

Among the NAAQS-established criteria pollutants are particulate matter equal to or less than 2.5 microns ($PM_{2.5}$) and equal to or less than 10 microns in diameter (PM_{10}), which may be a concern on some Army maneuver areas. **Figures 7 and 8** depict those counties in the U.S. which EPA has designated as nonattainment for $PM_{2.5}$ and PM_{10}, respectively. Fugitive dust may result from the use of tank trails and maneuver training and contribute to fine particulate matter emissions. For Army installations where fugitive dust needs to be managed to ensure compliance with the CAA or to minimize operational or safety concerns on the installation, those installations have incorporated control measures. An installation fugitive dust control plan typically describes all the fugitive dust sources as well as the technologically feasible and economically reasonable control measures and operational procedures that can be used to minimize dust on the installation.

Figure 7: Areas Designated as Nonattainment for $PM_{2.5}$

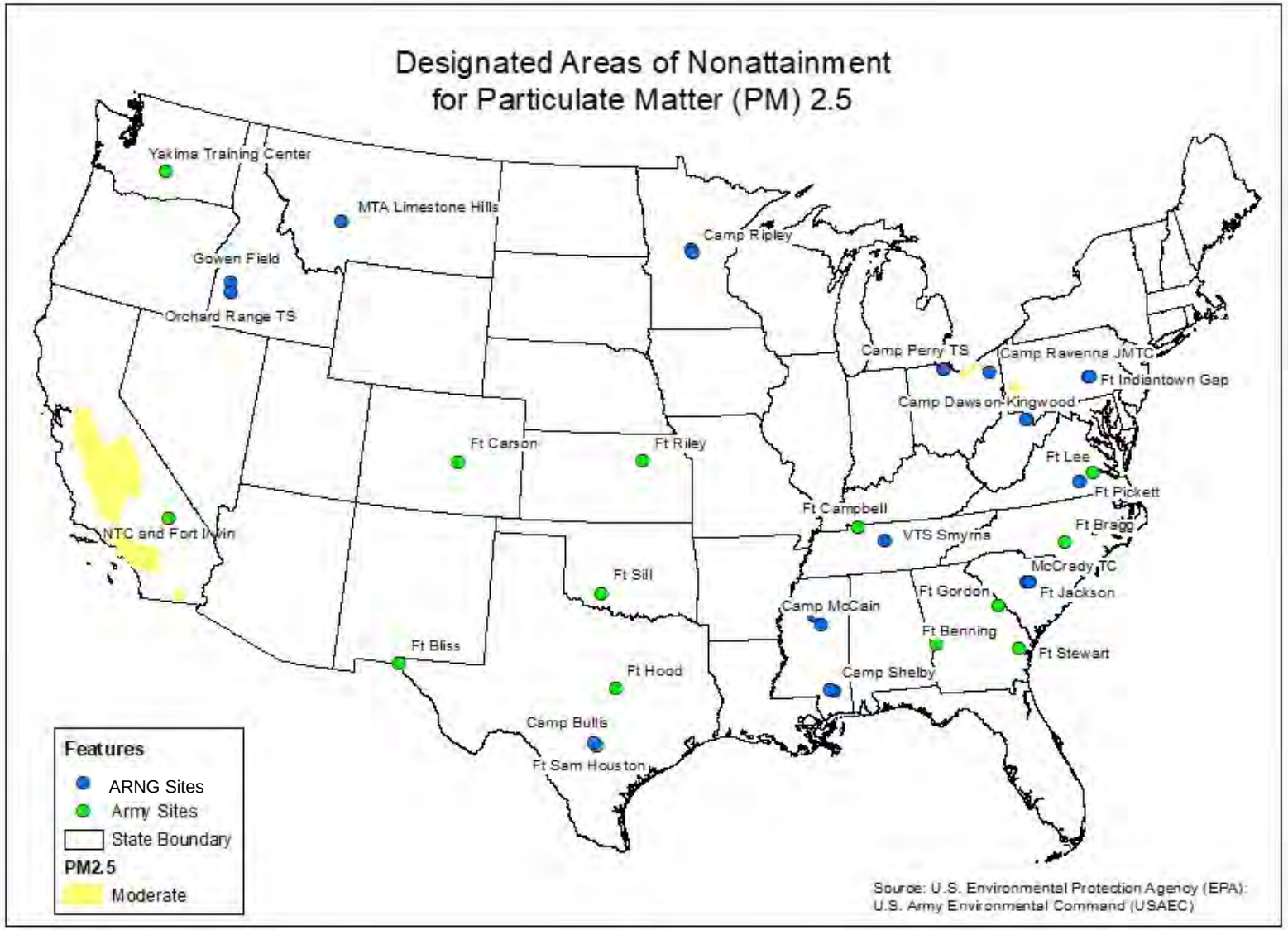
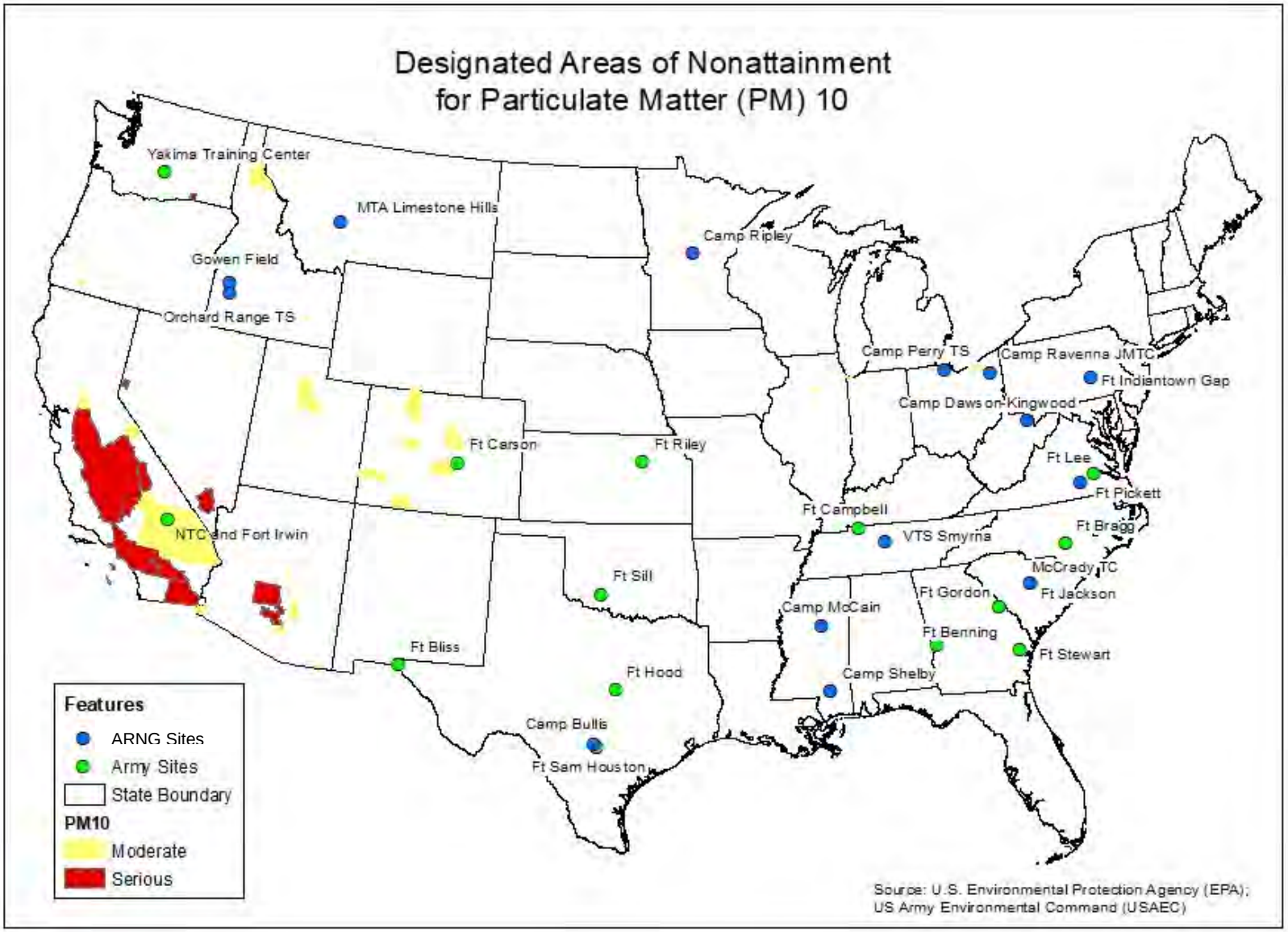


Figure 8: Areas Designated as Nonattainment for PM_{10}



3.2.2.2. Environmental Consequences

Impacts to air quality would be considered significant if the Proposed Action would result in a NAAQS attainment area becoming a nonattainment area.

Under the Clean Air Act rules, calculation of the dust or vehicle engine emissions is required if the area in which vehicles are being stationed is:

- in non-attainment for NAAQS
- one of the NAAQS affected by the dust and/or vehicle emissions (i.e., PM-10 for dust, Ozone or NOx for vehicle engine emissions)
- a major source (or in some cases a synthetic minor source) for Title V of the CAA
- exceeding the major source thresholds through vehicle engine emissions or the amount of dust generated.

If any of these conditions apply, the installation's Air Program Manager will determine rule applicability requiring emissions calculations and to identify any mitigation that would reduce any effects to less-than significant. The following information in **Table 6**: **Air Quality Status at Potential Installations** and **Table 7: Particulate Matter Information at Potential Installations** is provided to aid in determining whether an installation is close to a threshold or if calculations and appropriate reporting is completed.

Because each individual AMPV variant is replacing a M113 variant, no additive greenhouse gas (GHG) emissions will occur as a result of this action. Even though the AMPV is a larger vehicle, the updated equipment and engines used in comparison to the older M113s would make the AMPV a more efficient user of gas/diesel fuel. Additionally, the AMPV will have limited use only during training exercises and be used nominally during peace time operations. Executive Order (EO) 13990: *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (2021)* outlines policies that require federal agencies to consider GHG emissions and the social cost of GHGs of federal actions, while factoring in compounded global emissions. The GHGs are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. GHG emissions have increased over the last 20 years. The exact cause of the increase is irrelevant, but the problem of rising GHG and global warming is, as the Secretary of Defense and others have said, an existential problem. One thing is certain, concentrations increase from human activities such as burning fossil fuels, which can be controlled. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide, methane, Nitrogen Oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. The impacts of GHGs are limited to potentially minor effects on CO2, N2O, and CH4 emissions. They are not calculated or reported here. The Final Rule: Mandatory Reporting of Greenhouse Gases (74 FR 56260) requires reporting from engine and vehicle manufacturers, not fleet operators. In addition, US Army tactical vehicles are not certified under or subject to 40 CFR Parts 89, 1039, or 1065 as required for reporting by 74 FR 56260. In March of 2020, the Army implemented a Policy Memorandum that required that the Army consider the effect of climate change and GHG and the social cost of these specific listed GHG (also mentioned in EO 13990). Additionally, EO *14008: Tackling the Climate Crisis at Home*

and Abroad (2021) outlines policies to reduce greenhouse gas emissions and to strengthen resilience to the impacts of climate change. The EO directs CEQ to review, revise, and update its 2016 final guidance entitled, "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews." This guidance has been drafted and is under review; it is expected to be released in the coming months. For this action, given that the locations of the stationing action are only proposed at this time, it is difficult to predict what the effect of GHG emissions will be; the impact will depend on ambient air quality at the location where the stationing of the system occurs. Additionally, 40 CFR 1068.225(a)(1) defines engines/equipment, including the AMPV, that are exempt when "the equipment in which it will be installed has armor, permanently attached weaponry, or other substantial features typical of military combat." On a national and global scale, the addition of the weapon system would have a negligible impact on GHG based on the emissions of a limited number of training hours each vehicle would have, which would be comparable to the training hours already occurring with the M113s.

Table 5: Air Quality Status at Potential Installations

Installation	Air Quality	Attainment/Non-Attainment or Maintenance Area	Comment on Attainment/Non-Attainment
Fort Benning, GA	Title V Major	A	
Fort Bliss, TX	TX: Title V Major; NM: No Air Permit	A	Adjacent to a PM10 non-attainment area.
Fort Bragg, NC	Title V Major	A	
Fort Campbell, KY	Title V Major	A	
Fort Carson, CO	Title V Major	A	Cantonment area is a maintenance area for Carbon Monoxide. (All training ranges are in attainment.)
Fort Gordon, GA	Title V Major	A	
Fort Hood, TX	Title V Major	A	
Fort Irwin, CA	True Minor*	N-A	California has its own permitting system; it does not use the EPA's.
Fort Jackson, SC	Title V Major	A	
Fort Lee, VA	Title V Synthetic Minor	A	
Fort Riley, KS	Title V Major	A	

Installation	Air Quality	Attainment/Non-Attainment or Maintenance Area	Comment on Attainment/Non-Attainment
Fort Sill, OK	Title V Synthetic Minor	A	
Fort Stewart, GA	Title V Major	A	
JBLM / Yakima Training Center, WA	True Minor	A	PM 10 maintenance area
JBSA-FSH / Camp Bullis, TX	Title V Synthetic Minor / True Minor	N-A / N-A	
Camp Dawson-Kingwood, WV	No Air Permit	N-A	
Camp James A. Garfield JMTC, OH	No Air Permit	N-A	Portage County portion of post is N-A for Ohio 2015, 8-hour Ozone (0.070 ppm) effective 3Aug2018.
Camp McCain, MS	Synthetic Minor	A	
OCTC, ID	No Air Permit	A	
Camp Perry JTC, OH	No Air Permit	A	
Camp Ripley, MN	Title V Synthetic Minor	A	
Camp Shelby, MS	Title V Synthetic Minor	A	
Fort Indiantown Gap, PA	Natural Minor	A	
Fort Pickett, VA	Synthetic Minor	A	
Gowen Field, ID	No Air Permit		
McCrady Training Center, SC	No Air Permit	A	
MTA Limestone Hills, MT	No Air Permit	A	
Volunteer Training Site, Smyrna, TN	No Air Permit	A	

A: Attainment
N-A: Non-Attainment
M: Maintenance
*Not all installations provided information

Table 6: Particulate Matter Information at Potential Installations

Installation	Dust Control by Legal Requirement	Comment on Dust Control	PM 10, 2018 (in Tons)	PM 10, 2019 (in Tons)	PM 10 Avg (in Tons)	PM 2.5, 2018 (in Tons)	PM 2.5, 2019 (in Tons)	PM 2.5 Avg (in Tons)
Fort Benning, GA	Y	Military vehicle fugitive dust opacity is not regulated; however, general NAAQs requirements must be met.	8.81	7	7.905	8.81	0	4.405
Fort Bliss, TX	Y	2000 Fort Bliss, Texas and New Mexico, Mission and Master Plan PEIS addressed dust control issues at five intersections. Longer lasting dust suppression measures will be completed in July 2023.	15.17	40.91	28.04	12.75	4.02	8.385
Fort Bragg, NC	N		6.28	6.24	6.26	6.08	6.1	6.09
Fort Campbell, KY	Y		22.36	17.231	19.7955	22.36	9.368	15.864
Fort Carson, CO	Y	Fort Carson has an unusually stringent dust control requirement. Visible dust is not allowed to drift from Fort Carson off post.	22.36	17.231	19.7955	22.36	9.368	15.864
Fort Gordon, GA	Y		2.5	0.0075	1.25375	2.47	0.0075	1.23875
Fort Hood, TX	Y		17.99	29.05	23.52	13.06	18.71	15.885
Fort Irwin, CA**	Y	Dust control is a big issue.	NR	902.61	902.61	NR	99.69	99.69

Installation	Dust Control by Legal Requirement	Comment on Dust Control	PM 10, 2018 (in Tons)	PM 10, 2019 (in Tons)	PM 10 Avg (in Tons)	PM 2.5, 2018 (in Tons)	PM 2.5, 2019 (in Tons)	PM 2.5 Avg (in Tons)
Fort Jackson, SC	N		2.1	2.377	2.2385	2.1	2.377	2.2385
Fort Lee, VA	N		1.5	1.5	1.5	1.5	1.5	1.5
Fort Riley, KS	N		0	0.37	0.185	0	0.75	0.375
Fort Sill, OK	N		2.5	5.5	4	2.5	5.5	4
Fort Stewart, GA	Y		2.3	3.24	2.77	2.68	3.19	2.935
JBLM - YTC, WA	N		5	4	4.5	5	4	4.5
JBSA-FSH & Camp Bullis, TX			NR	NR	NR	NR	NR	NR
Camp Dawson-Kingwood, WV	N		n/a	n/a	n/a	n/a	n/a	n/a
Camp James A. Garfield JMTC, OH	Y		n/a	n/a	n/a	n/a	n/a	n/a
Camp McCain, MS	N		NR	NR	NR	NR	NR	NR
OCTC, ID	N		0.07	n/a	0.07	0.07	n/a	0.07
Camp Perry JTC, OH	Y		n/a	n/a	n/a	n/a	n/a	n/a
Camp Ripley, MN	N		0.203	0.307	0.255	0.203	0.307	0.255
Camp Shelby, MS	Y		0.152	0.159	0.1555	0.152	0.159	0.1555
Fort Indiantown Gap, PA	N		1.19	0.83	1.01	1.19	0.83	1.01
Fort Pickett, VA	Y		0.26	0.235	0.2475	0.196	0.183	0.1895
Gowen Field, ID	N		0.17	n/a	0.17	0.17	n/a	0.17
McCrady Training Center, SC	N		NR	NR	NR	NR	NR	NR
MTA Limestone Hills, MT	N		n/a	n/a	n/a	n/a	n/a	n/a

Installation	Dust Control by Legal Requirement	Comment on Dust Control	PM 10, 2018 (in Tons)	PM 10, 2019 (in Tons)	PM 10 Avg (in Tons)	PM 2.5, 2018 (in Tons)	PM 2.5, 2019 (in Tons)	PM 2.5 Avg (in Tons)
Volunteer Training Site, Smyrna, TN	Y		n/a	n/a	n/a	n/a	n/a	n/a

n/a: Not applicable
NR: No information reported in this time frame
* Not all installations provided information
** California has its own permitting program

3.2.2.3. No Action Alternative

Under the no action alternative, installations would experience no change from existing operations. Use of the M113 would continue. Installations that have issues with dust generation, erosion, or sedimentation would continue to employ measures to protect training land and keep it viable for military actions.

3.2.2.4. Action Alternative: Field AMPV units

Fugitive dust could result from AMPV maneuver area training and traversing tank trails. While the AMPV is larger and heavier than the M113 it will replace, it is comparable to the size and weight of a Bradley fighting vehicle but used much less often than the Bradley during training. The M113, and therefore the AMPV, are fielded to armor battalions. The three primary tracked vehicles of the armor battalion: Abrams, Bradley, and the M113 - being replaced by the AMPV - are fielded in approximately equal numbers. The missions/tasks supported by the M113 are substantially different than the Abrams and Bradley. The Abrams and Bradley are the primary warfighting vehicles and must maneuver extensively to engage and defeat the enemy. The M113 does not serve a primary warfighting role but supports the Abrams and Bradley, so the AMPV would maneuver only when necessary to support in the manner of the variant such as mission command, ambulance, medical treatment, or mortar carrier.

The change from the M113 to the AMPV could increase the amount of fugitive dust, since it is a slightly larger vehicle, and thus the amount of particulate matter generated may be slightly greater. In those instances, any particulate matter increase as a result of this action would still be comparable to that of other military vehicles performing the same operations on the same installation, and the installation should consult with their specific Air Program Manager to ensure permitting and reporting compliance. Therefore, even though the AMPV may generate more dust than the M113 it will still be substantially less than the Abrams and Bradley and not change the overall impact of dust on air quality. Installations would already be incorporating actions to resolve those impacts. If the installation has never had Bradley fighting vehicles, the air quality status, particulate matter information, the MIMs, Bailey's Ecoregion Classification, and Land Resiliency information provided can be used to identify comparable situations and resulting impacts. Utilizing these tools, recovery actions can be anticipated and employed. See **Table 2** which shows armored vehicles and artillery usage by individual installations. Installations should seek the advice of the installation Air Program Manager to ensure that all applicable reporting is completed. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

3.2.3. Geological and Soil Resources

Geological resources include the geology (e.g., bedrock), topography, and geological hazards. Soils are the unconsolidated mineral or organic material on the immediate surface of the earth that serve as a natural medium for the growth of land plants. Specific soils exhibit specific physical, chemical, and biological characteristics that aid in delivering a healthy ecosystem.

The geological and soil resources analysis within this PEA are limited to soil erosion within maneuver training areas and along tank trails; see section 3.1.1. As such, the ROI for this resource's analysis is the maneuver training areas and tank trails on the installation.

Soil impacts primarily result from construction activities, tactical digging, off-road vehicle movements (both cross-country and minimally maintained trails), explosive ordnance detonations, and borrow actions. These impacts include soil disturbance, erosion, and compaction. The areas affected by soil erosion and compaction occur throughout the maneuver and training areas, as well as the impact area.

Tactical digging refers to any process or activity involving the disturbance of soil, regardless of size, depth, or nature of excavation. This includes creating individual fighting positions, trenches, bunkers, berms, defilades, tank traps, or mine plowing. The off-road movements of both tracked and wheeled vehicles can compact lower soil horizons, loosen upper soil layers, disrupt root mats, create ruts, and remove vegetative cover. These impacts intensify as the soil's moisture levels and the numbers of vehicles increase. As vehicles repeatedly pass on non-hardened trails, the original corridors become less passable, and the damage can be spread laterally as vehicles attempt to by-pass the disturbed sites. To combat this trail widening, frequently driven trails are hardened with gravel or recycled asphalt pavement or leveled by road graders.
The repeated crossing of drainage channels at the same non-hardened location creates areas with gully erosion along sloped approaches, destabilized streambanks, and deeply cut stream channels. As the original crossing becomes less passable, the damage can be spread laterally as vehicles attempt to by-pass the disturbed sites. To combat channel damage, crossings are hardened in strategic locations, and unauthorized crossing sites are closed by placement of obstructions across access points.

Soils may be affected in the impact area's detonation zone by both non-explosive and explosive rounds. Erosion may be high at the locations of ordnance impact. The explosive force of live ordnance disturbs and exposes the soil surface as well as destroys protective vegetation cover and root mats. The danger posed by unexploded ordnance prevents actions from being taken to monitor or control soil erosion in the impact area.

Fires are frequently generated by weapons training impacts. Loss of vegetative cover following fires exposes the soil surface to wind and direct precipitation. Disruptive activities accelerate the natural erosion process by exposing the erodible soils to precipitation and surface runoff. The effect of this exposure on soil varies depending upon the soil type, depth to bedrock, degree of disturbance to vegetative cover, rainfall, and season of occurrence. Fielding of the AMPV will not add to any impacts caused by explosive ordnances.

As a consequence of maneuver actions, installations monitor soil conditions and quality. Soil erosion potentially impacts soils, water resources, and air quality. The degree of erodibility is determined by physical factors such as drainage, permeability, texture, structure, and percent slope. The rate of erodibility is based on the amount of vegetative cover, climate, precipitation, proximity to water bodies, and land use.

3.2.3.1. Affected Environment

While it is given that maneuver actions cause damage to land resources, installations do have management strategies in place to mitigate long-term damage. Bailey's Ecoregion Classification System is the basis for determining land resistance and resilience to determine the impact of equipment on lands. Understanding the ecoregions can assist in determining an area's ability to resist damage and to regenerate or return to former conditions.

The following information is taken from "Locations and Environments of U.S. Army Training and Testing Lands: An Ecoregional Framework for Assessment" as printed in the *Federal Facilities Environmental Journal*, Autumn of 1999 by Doe, W.W., et al. –

"Resistance is the ability of a natural system or population to remain essentially unchanged despite disturbances or stressors. Resilience is the ability of a system to recover after disturbance and return to its original state. These properties influence stability and persistence of plant populations, communities, and ecosystems over time. Resiliency is a function of several interrelated physical and climatic factors to include precipitation, vegetative cover type, growing season, seasonality, soil type and depth and topography. It is often expressed as a recovery period, defined as the time it takes a perturbed system to return to its former state after it has been perturbed and displaced from that state."

"[…] For the purpose of this analysis, training land resiliency is defined as the inherent capability of the land to support intensive military training and testing activities while sustaining the existing ecological system (physical-biological complex). One example of training land resiliency can be provided from the perspective of tracked vehicle maneuvers occurring within a designated training area. Resistance defines how many times, or how frequently, a certain type of vehicle (e.g., wheeled or tracked) can travel over an area before the natural community is disturbed from its original state.

Resiliency defines if and how quickly the community will restore itself (either naturally or through land rehabilitation intervention) following disturbance. […F]our categories of potential Army land resiliency are:

- High Resiliency;
- High to Moderate Resiliency;
- Moderate to Low Resiliency; and
- Low Resiliency."

Table 8 shows those categories with 31 Army installations identified and **Figure 9** shows the ecological land resiliency categories on a map. "Seven key Army installations are located in regions classified with low resiliency. Conversely, only two of the installations examined – Fort Riley, Kansas and JBLM – YTC, Washington, are located in areas of high resilience. The majority of installations are located within the two intermediate categories of resilience. A number of installations, for example those in the southeastern U.S., are located in close proximity to ecoregion boundaries", as seen on **Figure 9**. "Because these boundaries are general representations of areas that can be transition zones between different landscapes, installations should use this method as a

tool. On-site data and experience is a better indicator of conditions for individual installations.

This approach provides a logical basis upon which the Army can evaluate its strategic decisions concerning current and future land uses, as well as potential environmental consequences. For example, High to Moderate Resiliency lands might be viewed as the “mission capable” category, meaning that training lands within this category, or with a higher resiliency, have the potential to better sustain prolonged military land use. Conversely, those training lands in the lower two Land Resiliency categories are inherently more vulnerable to the long-term effects of military training. Such information could be used in making decisions about unit re-stationing and installation training density (Doe et al, 1999).”

Table 7: List of 31 major Army Installations by Land Resiliency Category

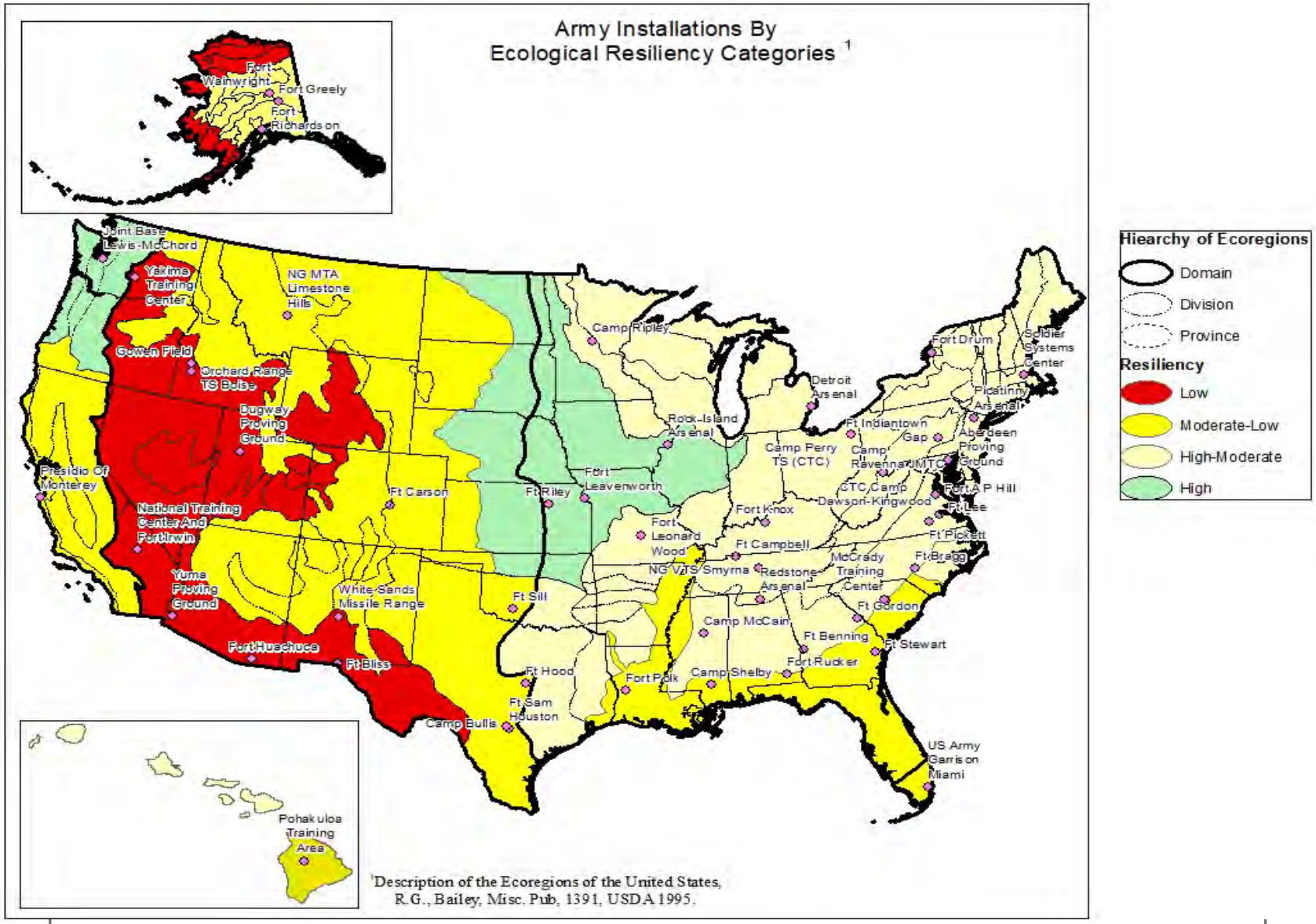
RESILIENCY CATEGORY	BAILEY'S ECOREGIONS (DIVISION-LEVEL)	INSTALLATIONS
High Resiliency	Marine	Fort Lewis
	Prairie	Fort Riley
High-Moderate Resiliency	Hot Continental	Fort Campbell
		Fort Drum
		Fort Knox
		Fort Leonard Wood
		Fort Benning
	Subtropical	Fort Bragg
		Fort Jackson
		Fort Gordon
		Aberdeen Proving Ground
		Fort A.P. Hill
	Rainforest	Schofield Barracks
Moderate-Low Resiliency	Subarctic	Fort Richardson
		Fort Wainwright
		Fort Greely
	Subtropical (Note 1)	Fort Rucker
		Fort Stewart
		Fort Polk
	Tropical/Subtropical Steppe	Pinon Canyon
		Fort Carson
		Fort Sill
		Fort Hood
	Rainforest (Note 2)	Pohakuloa Training Area
Low Resiliency	Tropical/Subtropical Desert	Fort Irwin
		Fort Bliss
		Fort Huachuca
		White Sands Missile Range
		Yuma Proving Ground
	Temperate Desert	Yakima Training Center
		Dugway Proving Ground

NOTE 1: These 3 Installations (Forts Rucker, Stewart and Polk) were placed in a lower Resiliency Category than other installations in the same Division because they have an average rainfall-runoff erosivity characteristic that is significantly higher, increasing the potential for soil loss and resulting in lower rates of recovery.

NOTE 2: Pohakuloa Training Area experiences a rain-shadow effect caused by adjacent mountain ranges which alters the vegetation characteristics of the installation from rainforest to tropical steppe. This characteristic, within the Hawaiian Islands, is not accounted for in Bailey's classification system.

**Note: Not all installations that are proposed for this action are represented in Table 8 above, and installations that are not being evaluated under this action are also included. This Table is provided as an example within the quote used from "Locations and Environments of U.S. Army Training and Testing Lands: An Ecoregional Framework for Assessment" by Doe et al.*

Figure 9: Army Installations by Ecological Resiliency Category



Fielding, operations, and maintenance of the AMPV would occur on existing test courses and ranges. Construction of new courses, installations, or facilities are not planned. Impacts on land are expected to be similar to that observed using other tracked, combat systems proven to exhibit nominal impacts to the environment.

Environmental management procedures for existing maneuver courses have already been established for previous generation vehicles and will translate easily for the use of the AMPV. No additional land development, rearrangement, or terrain modification is expected to be needed to meet the AMPV program requirements.

The fielding of the AMPV would be highly unlikely to alter or degrade soil, mineral content, and their respective health, as they overlay natural bedrock, manmade structures, and other parent material. Fielding of the AMPV is not expected to exhibit any exceptional soil impact beyond that observed from the operation and deployment of current combat vehicles.

AMPV vehicles will operate on existing ranges and training maneuver areas that have already been utilized for individual, unit, and crew training of other tracked combat vehicles (i.e., Bradley Fighting Vehicle Systems, Abrams Tank Systems, and M113). Since the actual training areas have already been disturbed by prior activities, any disturbance to soils surrounding the roadways will have already occurred, and as a result, installation personnel will have already constructed and implemented erosion control plans. Testing, training, and operation of the AMPV vehicles and subsystems will be performed in accordance with existing erosion control plans.

Operation of the AMPV during fielded use will primarily occur on paved or improved drive surfaces intended for vehicular travel. Off-road use may occasionally occur; however, repetitive off-road use will likely be restricted to designated ranges that are maintained and managed according to specific environmental plans (PdM, 2020).

Ground pressure data has been estimated for the AMPV and can be used by site personnel to determine the extent of potential soil compaction or erosion caused by the proposed action. This will assist in determining a means for implementing useful mitigative actions. AMPV ground pressure data is similar to the currently fielded Bradley Fighting Vehicle System.

3.2.3.2. Environmental Consequences

As discussed in Section 3.2.1.2, land rehabilitation and maintenance are key enablers for sustaining realistic training conditions. Best management practices to minimize and address erosion concerns support the sustainable use of maneuver areas, reduce safety hazards when soldiers train with the AMPV, and support the biological resources negatively affected from erosion activities. Installations with highly erodible soils in maneuver training areas are aware of the soil conditions and implement strategies to provide for land resiliency. Installations can use the above information to determine the impact of fielding AMPV at unidentified installations or at installations not specifically addressed in this analysis. Utilizing the AMPV instead of the M113 is not anticipated to

affect installations that have already been fielding similar systems. Impacts to geological and soil resources would be considered significant if the Proposed Action caused either substantial soil loss or compaction, or a violation of an applicable federal or state law, regulation, or permit.

3.2.3.3. No Action Alternative

Under the no action alternative, the AMPV would not replace the M113; however, soil conditions would remain consistent with current practices. Maneuver and training areas are subject to actions from multiple systems that are comparable in their effect upon soil. Installations have mitigation measures in place to ensure the viability of land resources for continued training.

3.2.3.4. Action Alternative: Field AMPV Units

Fielding the AMPV to replace the M113 could result in an increased risk of soil destabilization and erosion, notably in areas with moderately to highly erodible soils during off-road maneuvers. Maintenance activities, some of which could use heavy equipment, could cause negligible minimal impacts. Installations have systems in place to determine the extent of damage from training actions as well as proven techniques to reduce adverse soil impacts through rehabilitation and soil stabilization. Fielding the AMPV on a one-to-one exchange with the M113 would not cause a significant impact on soils in locations conducive to AMPV activities, consistent with system analysis finding and applicable soil erosion reduction measures. Consequences of military training on maneuver and training lands are the result of a mix of vehicles and equipment, not simply one system. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

3.2.4. Water Resources

Water quality refers specifically to the presence and concentration of pollutants dissolved, suspended, or floating in surface water (lakes, rivers, streams, water sheds, etc.), groundwater (subterranean hydrologic aquifers), and storm water (water shed from buildings, roads, parking lots, and other man-made structures). Surface water quality is regulated under the Clean Water Act (CWA; 33 USC § 1251 *et seq.*).

The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the nation’s waters” (33 U.S.C §1251(a)). Under Section 303d of the CWA, states, territories, and authorized Native American Tribes are required to develop lists of impaired waters. These are waters for which technology-based regulations and other required controls are not stringent enough to meet the water quality standards set by states. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. A TMDL includes a calculation of the maximum amount of a pollutant that can be present in a waterbody and still meet water quality standards (EPA, 2020). **Figure 10** represents the Section 303d impaired waters that have been listed because of siltation and sedimentation.

The water resources analysis within this PEA is limited to water quality affected by soil erosion originating from within maneuver training areas and along tank trails; see Section 3.1.1. As such, the ROI for this resource's analysis within this PEA encompasses the watershed in which installation maneuver training areas and tank trails are located, and the aquifers beneath which could potentially be impacted by the Proposed Action.

3.2.4.1. Affected Environment

Existing water resources on Army installations are representative of water resources across the U.S., and Army installations consist of numerous watersheds. Surface water bodies at Army installations include storm water, ponds, lakes, streams, rivers, and wetlands. A few Army installations abut near-shore marine waters and water resources regulated by the Coastal Zone Management Act (CZMA). Some installations have impaired waters, as defined by the CWA (see **Figure 10**), on or adjacent to the installation. Wetlands have been formally delineated at many Army installations. Groundwater resources include confined and unconfined aquifers that may provide drinking water, and/or industrial, landscaping, and agricultural water to the installation and/or surrounding communities, depending on the groundwater body's quality and quantity. At some installations, potable water comes from surface water sources.

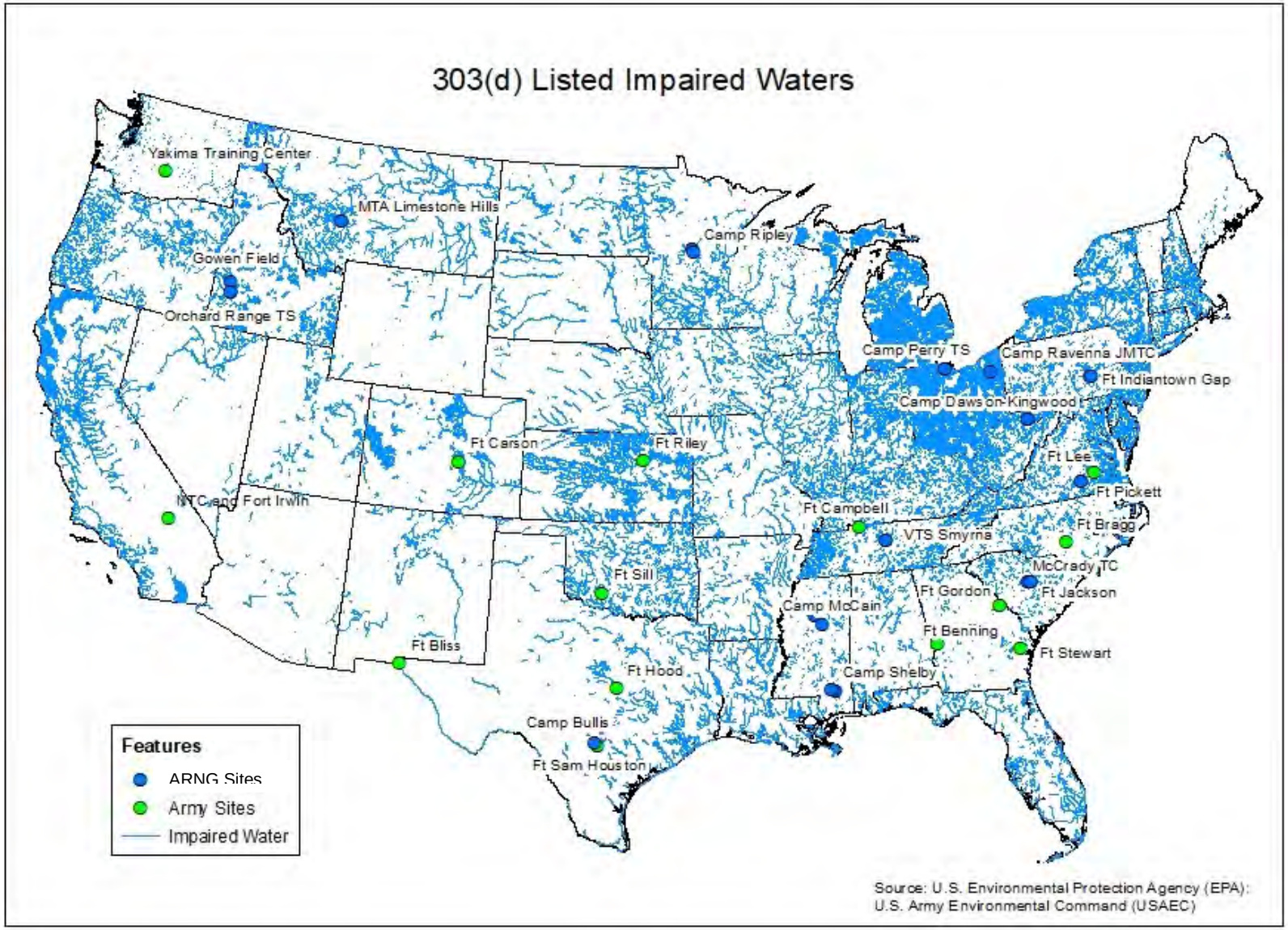
Potential impacts on water quality during AMPV fielding and operations could result from fording operations and leaks or spills of vehicle fluids, resulting in the subsequent discharge or transport of these fluids into local bodies of water. As part of the AMPV operational requirements, the vehicle will be capable of crossing bodies of surface water.

When used as intended, the AMPV's contact with rivers, streams, and waterways will be limited. The potential for erosion and sedimentation into waterways will be limited. Also, potential for spills because of accidents or catastrophic failure is unlikely. The AMPV has a sealed hull that will contain fluid leaks. Because of this, there is a possibility of the vehicle collecting a mixture of fluids, which can be drained. Testing, training, and operations would take place at existing facilities that have both Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention Controls and Countermeasures Plan (SPCCP) and protocols to immediately respond, contain, remediate, and prevent ground water contamination, or have SOPs for spill preventions and responses. Frequent vehicle inspections are required to ensure the vehicles remain in working order and within specifications. Should a leak or spill occur, operators are trained to immediately utilize the proper containment and collection of the POLs according to the Installation Spill Containment Plan (ISCP), the SWPPP, and the SPCCP (PdM, July 2020).

Once fielded, storage of the AMPV vehicles would be within motor pools or in areas that typically have concrete or bituminous surfaces. Many of these parking areas are designed with berms to contain possible leaks or spills of POLs from entering storm drains. Inspections would be completed at regular intervals to identify any leaks. Also, as a matter of protocol, "drip pans" and absorbents would be employed under the

vehicle to catch and retain any fluids that may leak and drip while parked. Environmental impacts to water quality related to leaks and spills are expected to be minimal based on the limited annual operations of the vehicle and the existing plans and procedures in place at the installations for management and clean-up of spills.

Figure 10: 303(d) Impaired Waters



The majority of AMPV operation would be limited to roadways, off-road trails, and controlled ranges. These test and training exercises would be consistent with those typical of existing Army tracked, combat vehicles and would not present additional out-of-ordinary, exceptional hazards or risks to local bodies of surface water, wetlands, or floodplains.

The AMPV system will be capable of fording. Installations use hardened surfaces at the water fording areas of the test range to include heavy coarse aggregate or concrete. These hardened surfaces would mitigate the creation of deep ruts and sediment dispersion. Any fording done as a part of a training exercise should be coordinated with the local environmental office at the installation to ensure that no restrictions apply. Any minor disruptions that do occur on a case-by-case basis, would be temporary as the minor rutting and suspended solids will settle naturally aided by time, varying water levels, and flowing water. Exhaust emissions should remain above the water column and not present a water quality aspect. When crossing streams, the operation of the AMPV would comply with the installations' ITAM Program and Range and Training Land Program (RTLP) as part of the Sustainable Range Program.

3.2.4.2. Environmental Consequences

Impacts to water resources would be considered significant if the Proposed Action rendered a water body no longer available for its beneficial use, resulted in a detrimental change in surface water impairment status, a detrimental change impacting potable groundwater, an impairment to the use of groundwater aquifers, or unpermitted direct impacts to jurisdictional wetlands or other regulated waters of the U.S.

3.2.4.3. No Action Alternative

Under this alternative, no changes to water quality are anticipated. Normal operations with a host of vehicles would still train on military lands. Best management practices would still be in effect and followed by installation personnel.

3.2.4.4. Action Alternative: Field AMPV units

Fielding the AMPV to replace the M113 would not significantly impact water quality. Consequences of military training on maneuver and training lands are the result of a mix of vehicles and equipment, not simply one system. Environmental management procedures for existing training courses have already been established for previous generation vehicles, and no significant impact is anticipated. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

3.2.5. Biological Resources

Biological resources refer to the living landscape – the plants, animals, microorganisms, and other aspects of nature – and are a component of every ecosystem. The structure and function of an ecosystem is largely determined by energy, moisture, nutrient, and disturbance regimes, which in turn are influenced by a variety of biological and non-biological factors, including climate, geology, flora, fire, hydrology, and wind. An eco-balanced habitat provides the basis for naturally occurring indigenous plant (flora) and

animal (fauna) life to be sustained and flourish. Aspects of biological resources management and activities on Army installations are regulated by federal laws and regulations such as the Endangered Species Act (ESA; 16 USC § 1531 *et seq.*), Marine Mammal Protection Act (MMPA; 16 USC § 1361 *et seq.*), Migratory Bird Treaty Act (MBTA; 16 USC § 703 *et seq.*), Bald and Golden Eagle Protection Act (BGEPA; 16 USC § 668 et *seq.*), and Sikes Act (16 USC § 670 *et seq.*).

The biological resources analysis within this PEA is limited to biological resources within maneuver training areas; see section 3.1.1. As such, the ROI for this resource's analysis within this PEA is the maneuver training areas and tank trails on the installation.

3.2.5.1. Affected Environment

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. North America ecoregions are depicted in **Figure 11**. Installations are charged with conserving biodiversity on military lands. The Sikes Act Improvement Act of 1997 requires the DoD and military services to prepare and implement INRMPs for each military installation with significant natural resources. The INRMP's aim is for sustainable management while ensuring no net loss in the capacity of the installation lands to support the military mission (US Fish and Wildlife, 2001). Installations have identified threatened and endangered species protected under the ESA and have enacted provisions that aid in the protection and potential proliferation of the species in installation specific INRMPs. Additional species may be undergoing 12-month status reviews under which the USFWS determines if listing of that specific as a threatened or endangered species is warranted. Specific species are listed under the individual installation in **Section 4**.

3.2.5.2. Environmental Consequences

Impacts to biological resources would be considered significant if the Proposed Action would result in unauthorized "take" of an ESA listed species or unauthorized adverse modification of critical habitat; local extirpation (wiping out) of a local rare or sensitive species population not currently listed under the ESA; a long-term loss or degradation of diversity within unique or high-quality plant communities; unacceptable loss of suitable habitat for protected species as determined by the USFWS; noncompliance with policies, regulations, and permits related to wetlands conservation and protection; and high probability of increasing the frequency and intensity of wildfires, especially in sensitive ecological areas.

3.2.5.3. No Action Alternative

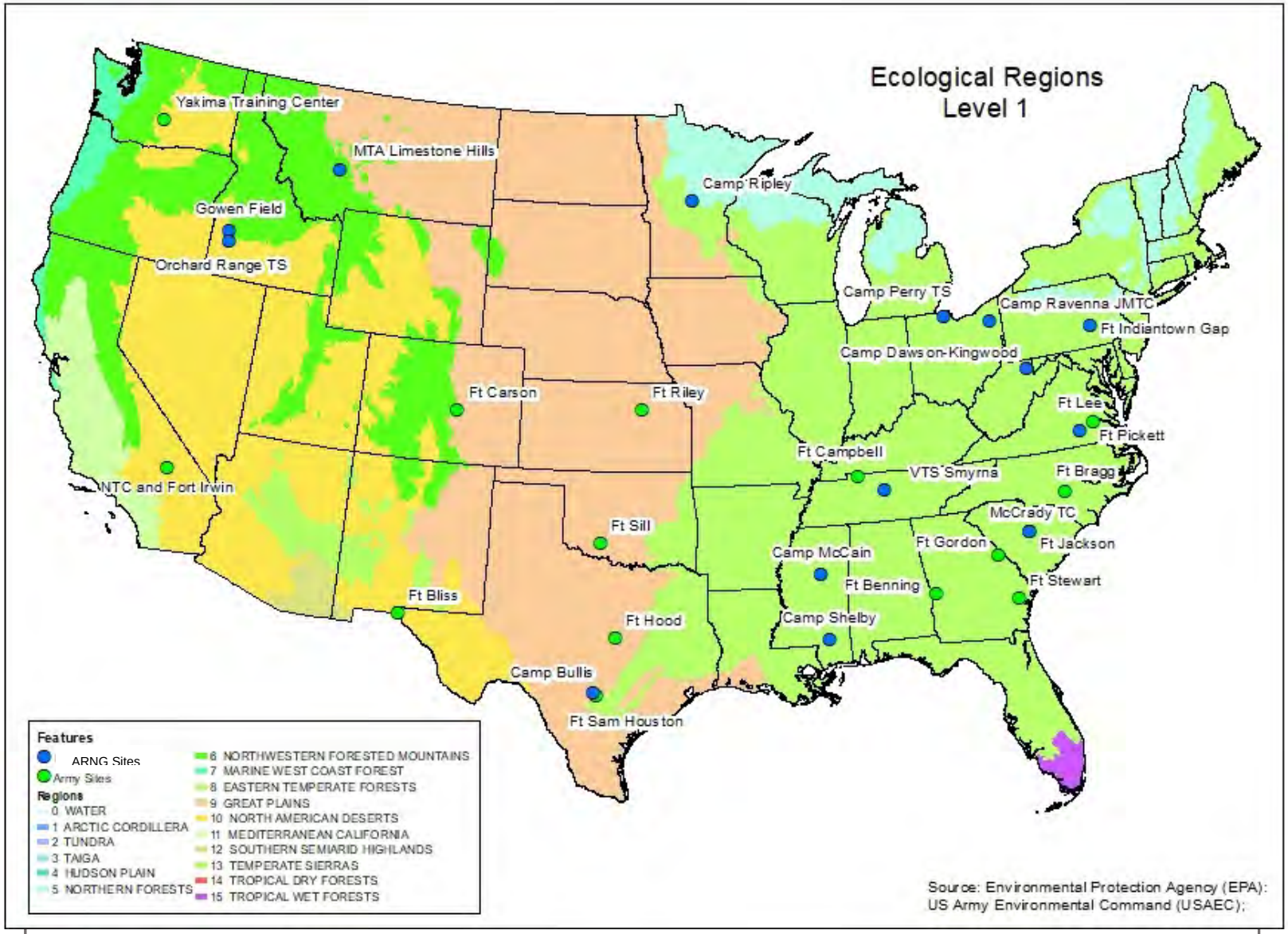
Under the No Action alternative, biological resources would continue to be affected by current maneuver and training actions. Installations have already identified the biological resources impacted by military training actions. Provisions for their protection are integrated into training and usage procedures.

3.3.5.4. Action Alternative: Field AMPV units

Fielding the AMPV would not significantly impact biological resources, including any endangered species, migratory birds, or Bald or Golden Eagles. Biological resources have been identified and protective measures are incorporated into the INRMPs. Some

installations have negotiated agreements to allow for military actions to occur while protecting sensitive resources. Because the AMPV will be using existing training tank trails, ranges, and other areas already used by armored tank vehicles, it is not expected that any installation will need to construct new or refurbish existing training or maintenance facilities. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

Figure 11: Continental U.S. Level 1 Ecoregions



3.2.6. Cultural Resources

Humans relate to their environment through their culture, which may include the natural environment, the built environment, and human social institutions. Cultural resources are the remains and sites associated with human activities, to include Native American archaeological sites, historic archaeological sites, historic buildings, and elements of the natural landscape which have traditional cultural significance. This includes, but is not limited to, those resources listed or eligible for listing in the National Register of Historical Places. Aspects of cultural resources management and activities on Army installations are regulated by federal laws and regulations such as the National Historic Preservation Act (NHPA; 54 USC § 300101 *et seq.*), Native American Graves Protection and Repatriation Act (NAGPRA; 25 USC § 3001 *et seq.*), Archaeological Resources Protection Act (ARPA; 16 USC §§ 470aa-470mm), and American Indian Religious Freedom Act (AIRFA; 42 USC § 1996).

The cultural resources analysis within this PEA is limited to cultural resources within maneuver training areas; see section 3.1.1. As such, the Area of Potential Effect (APE) for NHPA analysis of this resource within this PEA is the maneuver training areas and tank trails on the installation, as well as any associated viewsheds protected under a cultural resources law or regulation which are potentially affected by the Proposed Action. All historic properties within an APE as defined by NHPA constitute the affected environment and ROI for cultural resources for the purposes of this analysis.

3.2.6.1. Affected Environment

Installations have identified many cultural resources that are on military installations; however, not all areas have been fully surveyed. The fielding of the AMPV would be on established military training areas. These areas have experienced years of activity; therefore, it is unlikely that any cultural resources possibly present have not already been discovered or retain their cultural integrity. The installations identified as potential fielding locations for the AMPV have Integrated Cultural Resource Management Plans (ICRMPs). Utilizing the practices identified in this plan allows for military training actions while ensuring cultural resource preservation. Units are trained in adhering to the areas identified as allowable for training. Practices are in place to prevent or lesson effects to cultural resources and sites, e.g., Pinon Canyon has a “stand-off” distance to protect rock art from vibrational damage from military equipment. Some installations cap cultural sites with concrete to protect the site until an archaeological survey can be completed. Most installations also use “sensitive area” or “no digging area” signs around protected cultural resources to avoid impacts to resources/sites.

3.2.6.2. Environmental Consequences

Impacts to cultural resources would be considered significant if the Proposed Action resulted in NHPA-defined adverse effects to a historic property listed or eligible for listing in the NRHP, unless mitigated in compliance with NHPA Section 106, such as through a Memorandum of Agreement (MOA) with the State Historic Preservation Office (SHPO), and possibly with the Advisory Council on Historic Preservation (ACHP), to resolve adverse effects; created conditions that would stop the traditional use of sacred or ceremonial sites or resources, without discussions on a government-to-government

level with the affected Tribe(s); or, resulted in a violation of compliance with NAGPRA or other applicable cultural resource laws and regulations.

3.2.6.3. No Action Alternative

Under the No Action alternative, installations would abide by the practices described in their ICRMPs. Installations have already identified the cultural resources impacted by existing military training actions. Provisions for their protection are integrated into training and usage procedures.

3.2.6.4. Action Alternative: Field AMPV units

Fielding the AMPV would not significantly impact cultural resources, as the AMPV variants are similar to what is currently utilized at the installations, in the same training areas and in approximately the same manner. Cultural resources have been identified on specific installations and protective measures are incorporated into the ICRMPs. Some installations have negotiated agreements to allow for military actions to occur while protecting cultural resources. No major changes in use are anticipated, so impacts to historic properties or cultural resources are not anticipated as a result of the Proposed Action. Any additional areas that are not currently used by similar systems or in similar practices and have not been surveyed for cultural resources may require additional consultation prior to fielding the AMPV. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

3.2.7. Transportation and Traffic

Transportation considers the increased traffic (if applicable), whether by rail, air, or road (vehicular or by foot) and evaluates its direct influence to increased congestion and degradation of transportation infrastructures.

The transportation and traffic analysis within this PEA is limited to tank trails and their intersections with other transportation infrastructure on installations. As such, the ROI for this resource's analysis within this PEA is the transportation infrastructure containing or intersecting installation tank trails.

Both the M113 and AMPV variants are tracked vehicles. Training Area Roads, or "Tank Trails," are maintained by the Sustainable Range Program. From a mobility perspective, tracked vehicles offer the best solution for a versatile platform that is required to operate over diverse terrain, including extremely difficult ground, because tracks inherently provide a greater surface area than wheels, resulting in a lower ground pressure.

3.2.7.1. Affected Environment

At most installations, roads serving the cantonment area are paved whereas roads serving the training and testing areas are mostly unpaved. There is no extraordinary characteristic of the AMPV either in weight or dimensions that make it likely to contribute to excessive wear of drive surfaces (PdM, July 2020). However, since the AMPV is a heavier vehicle than the M113 it is replacing, installations may need to consider Tank Trail Maintenance and the funding required for it.

3.2.7.2. Environmental Consequences

Construction of new courses, installations, or facilities are not planned. Impacts on land are expected to be similar to that observed using other tracked, combat systems proven to exhibit nominal impacts to the environment. Utilizing the AMPV instead of the M113 is not anticipated to affect installations that have already been fielding similar systems. Impacts to transportation and traffic would be considered significant if the Proposed Action caused either substantial degradation to tank trails and roadways within the ROI, or a violation of an applicable federal or state law, regulation, or permit.

3.2.7.3. No Action Alternative

A typical installation will have already adjusted to the fielding of other generational vehicles. No significant impact should result from this action.

3.2.7.4. Action Alternative: Field AMPV units

A typical installation will have already adjusted to the fielding of other generational vehicles but may need to consider a Tank Trail Maintenance plan. No significant impact should result. Refer to *Section 4.0. Potential Installations and Impact Considerations* and ***Table 9****: Summary of Potential Effects of the Evaluated Alternatives* for additional detail.

3.3. Cumulative Effects Analysis

A cumulative effects analysis is required to assess the effects of the Proposed Action when combined with the effects of other past, present, and reasonably foreseeable future projects that would affect the same resource element(s), regardless of what entity is implementing the other project(s). The Army is undertaking a modernization effort as described in Section 1 that would result in numerous changes to personnel, weapons, and capabilities at the installations assessed in this PEA. However, since the AMPV system would be a complete one-to-one replacement for the M113 Family of Vehicles (FoV), impacts to the environment are not additive. No significant cumulative impacts were identified in the AMPV LCEA and FONSI (PdM, July 2020).

Activities related to the AMPV will take place at existing facilities with similar equipment and where similar activities already occur. These installations already have active programs, plans, and SOPs in place to mitigate potential environmental impacts. Construction of new test and training courses, installations, or facilities are not planned, and the AMPV will operate on existing test ranges and training maneuver areas that have already been utilized for testing and individual, unit, and crew training of other tracked combat vehicles (i.e., the M113 FoV, the Bradley Fighting Vehicle Systems FoV, and the Abrams Tank Systems).

Since the actual test and training areas have already been disturbed by prior activities, any disturbance to soils surrounding the roadways will have already occurred, and as a result, installation personnel will have already constructed and implemented erosion control plans, and no additional land development, rearrangement, or terrain

modification is expected to be needed to meet the AMPV program requirements. Testing, training, and operation of the AMPV vehicles will be performed in accordance with existing erosion control plans.

Outside of testing and training, operation of the AMPV during fielded use will primarily occur on paved or improved drive surfaces intended for vehicular travel. Off-road use may occasionally occur; however, repetitive off-road use will likely be restricted to designated tank trails and ranges that are maintained and managed according to specific environmental plans. The AMPV will utilize existing infrastructures for storage, maintenance, cleaning, and transport of which are subject to existing environmental management plans. New land development for the storage, maintenance, operation, or overhaul of the AMPV is not anticipated (PdM, July 2020).

A typical installation will have already adjusted to the fielding of other similar vehicles. No significant cumulative impacts should result from this proposed action. Refer to **Section 4.0**. Potential Installations and Impact Considerations and **Table 9**: Summary of Potential Effects of the Evaluated Alternatives for additional details.

4.0. POTENTIAL INSTALLATIONS AND IMPACT CONSIDERATIONS

This section provides a listing of installations considered for potential AMPV fielding as a replacement for the M113. A brief description of some, not all, relevant facts to consider regarding impacts is given. All of the installations and units meet the screening criteria provided within Section 2.1 of this PEA. A mission description is provided, along with environments and environmental management factors relevant to fielding, operations, and managing potential environmental impacts to show that the proposed fielding of the AMPV in place of the M113 is in keeping with the mission of the installation. In Section 5.0, **Table 9** shows potential impacts to resources that may occur at each installation. Prior to any installation fielding the AMPV to a unit, the corresponding installation management staff will review the impact analysis and the applicable description in this PEA to determine if conditions at the installation align with the attributes in Section 3.1. If so, installation management staff would complete a REC citing this Programmatic Environmental Assessment for Armored Multi-Purpose Vehicle (AMPV) fielding when the aforementioned conditions are present. For those locations where the environmental impacts are uncertain after reviewing this analysis, installation management staff should use the included Environmental Checklist in **Appendix A** for impact determinations and to ensure that all environmental resources are considered. If the environmental impacts are not covered by this analysis and the checklist indicates that there is an environmental impact, utilize this PEA as the framework for developing a Supplemental Environmental Assessment that captures the environmental impacts at the installation. Because the AMPV is replacing the M113 at a one-to-one ratio and are largely being fielded at locations that are already using the Bradley fighting vehicle, which is similar to the AMPV in weight distribution and ground pressure, it is likely that there would be no net difference in environmental impacts to previously disturbed areas.

The areas of concern are air quality and dust generation, sedimentation, erosion, and possibly water quality. Some installations are currently required to control, mitigate, and report dust emissions. The change from the M113 to the AMPV could increase the amount of particulate matter generated. In those instances, consult the specific installation's Air Program Manager to ensure permitting and reporting compliance.

Installation resources are protected through a combination of environmental preservation actions as implemented in the INRMP, ICRMP and the ITAM Program as well as other agreements and strategies as mentioned in Section 3.0.

Unless more information is included for a particular environmental resource, the analysis for a typical installation applies.

A summary of the potential effects of the evaluated alternatives is in Section 5.0.

4.1. Fort Benning, Georgia

Fort Benning is the location of the Maneuver Center of Excellence, which includes the Infantry School and Armor School. Fort Benning's mission is:

- to plan and budget for the construction, modernization and sustainment of ranges and the training complex;
- provide safe operations and coordination, scheduling and control of ranges, the training complex and airspace;
- furnish, maintain and sustain the target system in support of the Maneuver Center of Excellence and tenant units;
- monitor, maintain, and sustain the use of ranges and training areas; and
- develop and maintain procedures for safe live-fire and maneuver for commanders and units.

Fort Benning has a legal requirement for dust control, is in an attainment zone, and is a Major Source under Title V of the Clean Air Act; however military tactical vehicles are exempt from air quality pollution controls (40 CFR 1068.225(a)(1)).

Threatened and endangered species found on the installation include red-cockaded woodpecker *(Picoides borealis)*, wood stork *(Mycteria americana),* shinyrayed pocketbook *(Hamiota subangulata),* and 6 plant species – the Fringed Campion *(Silene polypetala)*, Georgia rockcress *(Arabis georgiana)*, Harperella *(Ptilimnium nodosum)*, Little Amphianthus *(Amphianthus pusillus)*, Michaux's sumac *(Rhus michauzii)*, and Relict trillium *(Trillium reliquum)*. The gopher tortoise *(Gopherus polyphemus)* is a candidate species found on the installation. The red-cockaded woodpecker population has recovered; current training includes preservation and protection measures. The bald eagle *(Haliaeetus leucocephalus)* is also present on Fort Benning.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Benning.

4.2. Fort Bliss, Texas

Fort Bliss is the largest U.S. Army training installation and the only troop training installation in the continental United States capable of supporting long-range overland missile firings. It is one of DoD's power projection platforms, maintaining state-of-the-art training areas, ranges, and facilities. In order to accomplish these missions, Fort Bliss requires modern, state-of-the-art training ranges, and sufficient training lands that support all unit training on the installation. Fort Bliss supports mechanized maneuver training, numerous live-fire, and qualification ranges, unit tactical exercises (active and reserve components), and air defense and air-to-ground training required to be combat ready. Missions carried out on Fort Bliss training areas include joint training exercises (JTX), unified command training, unit training, combat support, combat service support, weapons testing, joint training with allied nations and training activities conducted by other services (Fort Bliss, 2016)

Fort Bliss is in an attainment zone; however, it is adjacent to an area that is in non-attainment for PM 10. Dust controls are a legal requirement. Previous NEPA analysis has required dust control mitigation on the road that leads from the cantonment area to training ranges. This road is adjacent to a major freeway, and dust could cause visibility issues. Current dust control efforts should be sufficient to address dust generated by military training to include fielding the AMPV. The installation is a major source for Title V permitting purposes.

The Northern Aplomado Falcon *(Falco femoralis septentrionalis)*, Southwestern willow flycatcher *(Empidonax traillii extimus)* and Sneed's Pincushion Cactus (*Coryphantha sneedii var. sneedii*) are endangered species found on the installation. Threatened species found on the installation include the Mexican spotted owl (*Strix occidentalis lucida*), Piping Plover *(Charadrius melodus)*, red knot (*Calidris canutus rufa*), and the Yellow-billed Cuckoo (*Coccyzus americanus*).

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Bliss.

4.3. Fort Bragg, North Carolina

Fort Bragg is home to the Army's Airborne and Special Operations Forces and is one of the largest military installations in the world. As the Army's preeminent power projection platform, its troops must be prepared to deploy to any location in the world within 18 hours and fight to win. To support this formidable force projection capability, the Army has invested resources to develop and maintain a vast supporting infrastructure of buildings, airfields, ranges, and training lands at Fort Bragg.

In order to provide realistic training conditions, contingency and special operations training at Fort Bragg require the availability of training areas that replicate as many biogeographic conditions as possible. Areas that may be encountered during missions include forests, swamps, and deserts. Natural resource conditions that support the military mission include: 1) forested areas for concealment of fixed locations and maneuver; 2) open areas for firing, airborne operations, and fixed activities; and 3)

water resources for SCUBA training, water rescue, special operations, water purification, decontamination, and other water-dependent training exercises.

Most training lands should have resilient ground cover or be otherwise developed to withstand vehicular traffic, helicopter rotor wash, excavations, or other activities that can lead to problems such as erosion or dust creation.

The two major types of training at Fort Bragg consist of maneuvers and live-firing exercises (Fort Bragg, 2011).

Fort Bragg's air quality status is attainment, and dust control is not a legal requirement.

Threatened and endangered species found on the installation are the red-cockaded woodpecker, Saint Francis' satyr butterfly (*Neonympha mitchellii francisci*), the American burying beetle (*Nicrophorus americanus*), and the Northern Long-Eared Bat (*Myotis septentrionalis*). The rough-leaved loosestrife (*Lysimachia asperulaefolia*), Michaux's sumac, and American Chaffseed *(Schwalbea americana)* are endangered plants present. The bald eagle is also present at Fort Bragg.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Bragg.

4.4. Fort Campbell, Kentucky

The primary mission at Fort Campbell is the training, housing, and support of military forces for deployment in support of contingency operations. The post provides training, readiness, and deployment support for active component units, mobilizes, and deploys active and reserve component units, and provides effective support for soldiers and their families during peacetime and war.

The two major types of training conducted are maneuvers and live-fire exercises. Impacts resulting from these activities include the destruction of terrestrial and aquatic habitat and soil erosion. Maneuver damage is by far the most widespread negative effect on the natural resources at Fort Campbell. Maneuvering heavy wheeled vehicles across even the best-suited landscapes can cause damage to vegetation and soils.

Vehicle maneuvers, tracked and wheeled, have the potential to cause the greatest military related impact to the Fort Campbell ecosystem. Vehicles used by the 101st Airborne Division and tenant units range from High Mobility Multipurpose Wheeled Vehicles (HMMWVs) to Mine Resistant Armored Vehicles (MRAP) vehicles. Military vehicle training may involve single vehicle maneuvers up to platoon or company-sized elements. Soil compaction and erosion are the most probable results of vehicle maneuvers. Appropriate planning (e.g., avoiding steep slopes, highly erodible soil types, and wet soils) and preparation (gravelling of tank trails, etc.) can mitigate much substrate damage. Immediate repair of any damaged areas after training maneuvers ensures no net loss of training area.

Fort Campbell's air quality status is attainment, and dust control is not a legal requirement.

The greatest benefit of the training mission is light to moderate military disturbance. Fort Campbell supports thousands of acres of barren/grassland habitat that requires periodic

soil disturbances. While other lands in the region have been converted to other uses, Fort Campbell has retained the natural character of the landscape, acting as a refuge for many rare plants and animals and threatened natural plant communities (Fort Campbell, 2020). The gray bat (*Myotis grisescens*), the Indiana bat (*Myotis sodalist*), and the Northern long-eared bat are all endangered bats present on the installation.

Fielding of the AMPV is not anticipated to have a significant environmental impact on Fort Campbell.

4.5. Fort Carson, Colorado

Fort Carson is one of the Army's premier power projection platforms. As such, it has a high priority role in deploying and mobilizing units during wartime. Fort Carson military units must be prepared to quickly deploy while other units move to Fort Carson and the Piñon Canyon Maneuver Site (PCMS) for mobilization training and continued deployment. The Army recently stationed a combat aviation brigade, or CAB, at Fort Carson.

Fort Carson and the PCMS also support the Colorado National Guard, Army Reserve units, U.S. Army Space and Missile Command, and other military units. The mission of Fort Carson is to train, house, mobilize, deploy, and sustain combat-ready, multi-component integrated forces. The mosaic of natural communities and the varied topography found on Fort Carson and the PCMS, as well as climate extremes ranging from hot summers to cold winters, provides U.S. service members with a variety of training scenarios.

Fort Carson is used for live-fire gunnery and is best suited for squad to battalion-sized and land training of both reserve and active components. Training is nearly continuous year-round.

The PCMS is best used for battalion and brigade-sized maneuvers, land training, small arms live-fire ranges, and force-on-force exercises, usually by mechanized infantry (covered in the PCMS EIS, 2015). With the conversion of a Light Infantry Brigade to a Mechanized Stryker Brigade, heavy maneuver training events of both light and heavy vehicles will likely occur more regularly than in the past, resulting in a predicted 12.5% increase in MIM, split between Fort Carson and PCMS.

Fort Carson employs protective measures like limiting use of areas or making locations restricted for environmental resource protection. Additionally, there is a stand-off distance for maneuvering exercises to mitigate the possible damage to rock art from vibrations occurring during maneuver training (Fort Carson, 2013).

The effects of this increased training on natural resources are covered in the Environmental Assessment (EA) for the Conversion of 4ID Infantry BCT to Stryker BCT (IBCT to SBCT EA 2019).

Fort Carson's air quality status is in attainment, and dust control is a legal requirement.

The Mexican spotted owl is a threatened species at Fort Carson, along with a non-essential population of the endangered Black-footed ferret (*Mustela nigripes*).

Fielding of the AMPV is not anticipated to have a significant environmental impact on Fort Carson.

4.6. Fort Gordon, Georgia

The Fort Gordon Training Complex consists of active ranges, a Convoy Live-Fire Course, artillery firing points, mortar points, drop zone, fixed-wing runway, special facilities, and training areas. The ranges are supported by a Small Arms Impact Area (SAIA) and an Artillery Impact Area (AIA). Adjoining the ranges are maneuver training areas capable of supporting Battalion and Brigade Combat Support, Service Support, and Heavy/Light Company or Light Airborne Battalion level maneuver.

Heavy training impacts on Fort Gordon have been limited to two principal areas. The SAIA is in the center of the installation and encompasses active firing ranges. Heavy artillery detonation occurs in the AIA located on the western end of the installation.

Military training has the potential to disturb the soil surface resulting in increased soil erosion and sedimentation of surface waters on the installation. Timber harvesting practices associated with forest and wildlife management activities have the potential to disturb soils and increase soil erosion and sedimentation. Soil disturbance also has the potential to impact cultural sites (Fort Gordon, 2018).

Fort Gordon's air quality status is attainment, and dust control is a legal requirement.

Endangered species found on the installation include the wood stork and the red-cockaded woodpecker - current training includes preservation and protection measures for the latter. The gopher tortoise, a candidate species, is also found on the installation, along with the bald eagle.

Fielding of the AMPV is not anticipated to have a significant environmental impact.

4.7. Fort Hood, Texas

Fort Hood's mission is to provide an efficient and effective power projection platform—training, mobilization, deployment, and sustainment support—to produce the world's best trained and most lethal warfighters. Fort Hood provides state-of-the-art facilities to support the full spectrum of training requirements of today's modern armed forces. Installation lands and ranges provide excellent training opportunities for mechanized maneuver and small unit exercises, combined arms training, and live-fire training.

Land use at Fort Hood is allocated primarily to cantonment areas, maneuver/live-fire training areas, and airfields. The cantonment areas are essentially urban and contain all the administrative, maintenance, housing, logistical, and other installation support land uses. The maneuver/live-fire training areas are where combat training activities occur. Two airfields are adjacent to the cantonment areas. The Belton Lake Outdoor Recreation Area is at the southeastern edge of the installation, adjacent to Belton Lake.

West Fort Hood contains the Robert Gray Army Airfield (RGAAF), research and administrative facilities, support facilities, military personnel housing, and ammunition storage. Training activities on West Fort Hood consist mostly of dismounted training, such as land navigation. North Fort Hood (NFH) is the primary site for reserve

component training and mobilization. In a period of continuous combat operations, NFH is the primary mobilization platform for reserve component (RC) Army forces, joint or interagency training, deployment, and demobilization. All phases of preparation for Overseas Contingency Operations (OCO), deployment and redeployment of personnel, and recovery operations are conducted at NFH. It serves as the mobilization platform for RC aviation units, which are supported by two auxiliary airstrips, configured to support aviation training. The maneuver area training site serves a similar function in support of reserve deployment units training at NFH.

Historically, an expansive network of gullies has developed across the Western Maneuver Area. Heavy mechanized maneuver across the land produces bare soil, void of vegetative cover, which increases water and wind erosion. A gully network has been established from the cumulative damage that has occurred over the past 60 years. The damage has accelerated during the past 20 years because vehicles used for military training have become greater in number, heavier, and faster, causing increased damage to soils. Decades of continuous training with minimal land repair efforts resulted in compacted soils in some areas that did not permit rainfall infiltration needed to sustain perennial vegetative growth. In addition, cattle grazing and inadequate land repair funding have contributed to the problem. Over the past 20 years however, gully damage has been minimized by maneuver access structures and the improvement of stream crossings are beginning to slow the sedimentation rate (Fort Hood, 2019).

Fort Hood's air quality status is attainment, and dust control is a legal requirement.

Endangered species found on the installation include the golden-cheeked warbler (*Setophaga chrysoparia*) and the whopping crane (*Grus americana*), and the Texas pimpleback mussel (*Cyclonaias petrina*), which is a candidate species.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Hood.

4.8. Fort Irwin, California

Fort Irwin has been used for antiaircraft, armored, and mechanized training for regular Army and National Guard units since 1940. Fort Irwin was selected as the National Training Center (NTC) for the U.S. Army in 1979. The NTC provides the critical edge in training brigade-level units in highly realistic combat situations.

Battlefields, landing fields, target arrays, logistics corridors, storage areas, ranges, support areas, and safety buffer areas on NTC comprise a laboratory where forces can test both soldiers and equipment to practice and perfect the principles of engagement for tomorrow's armed conflict.

Ten rotations, each consisting of an Army brigade combat team of four combat battalions and all associated support units come to the NTC and Fort Irwin annually for intensive combat training against an opposing force. Each training rotation closely replicates the movement of the brigade to an austere theater of war, combat operations, and post combat recovery and re-deployment. The California Army National Guard often trains on weekends between scheduled NTC and Fort Irwin training rotations. During other stages of field training, the brigades also conduct large-scale, live-fire

operations that allow the brigade to employ the full range of organic and supporting weapons, from rifles to bombs, and rockets from Air Force aircraft.

Exercises include the use of the M1A main battle tank, the M2 Bradley Fighting Vehicle, and other wheeled and tracked vehicles (Armored Personnel Carriers).

Most live-fire training takes place in an extensive network of automated targets in the northern part of the Fort Irwin training area. Machine guns, rifles, and the cannons of tanks and armored personnel carriers can fire live ammunition in a very realistic, unconstrained manner, unlike most range operations. Hellfire missiles, 2.75-inch rockets, and Tube-launched, Optically tracked, Wire-guided (TOW) missiles can also be fired, but other missile and rocket systems retain their MILES eye-safe laser capabilities because of the cost of these projectiles. During live-fire exercises, maneuvering units must cross minefields and negotiate concertina wire and other obstacles as they engage the enemy. Sequential pop-up targets simulate progressive movement by the enemy, including alternating frontal and flank views to simulate movements around obstacles or responses to terrain contours.

Another live-fire complex is the much smaller multi-range Fort Irwin Range Complex located on Goldstone Road just east of the Goldstone Deep Space Communication Complex. This range complex is used for small arms fire (rifle, pistol, and shotgun), both light and heavy machine guns (7.62 mm and 0.50 caliber), grenade launchers, tank main gun, and Bradley 25 mm main gun, mortars, antitank missiles, and hand grenades. Most large projectiles are not explosive but are inert (training rounds) or high velocity sabot non-explosive tank rounds.

Large quantities of dust emissions are generated on Fort Irwin. Fort Irwin works to reduce the generation of PM 10 through the maintenance of most playas as off-limits, the application of dust retardants to main tank trails, and the revegetation of damaged lands and closures of trails (Fort Irwin, 2018). Fort Irwin’s air quality status is non-attainment, and dust control is a legal requirement.

The area is also habitat for over 462 species of Mojave Desert plants and home to hundreds of species of animals. The desert tortoise (*Gopherus agassizii*) is a threatened species present on the installation. The Lane Mountain milk-vetch (*Astragalus jaegerianus*) is an endangered plant species present on the installation.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Irwin.

4.9. Fort Jackson, South Carolina

Fort Jackson’s primary mission is Army Basic Combat Training (basic). The installation is one of five BCT installations in the nation. After soldiers complete basic, they progress to Advanced Individual Training (AIT) at Fort Jackson and many other installations across the United States. There is limited AIT training offered at Fort Jackson.

Fort Jackson provides ranges and maneuver training areas on its 52,000-acre U.S. Army Training Center, principally designed to support the institutional training organizations and units garrisoned on the installation. Fort Jackson is also tasked with supporting reserve component unit training and the mobilization and demobilization of Army reserve/Navy component units and personnel.

Coalition training is supported upon mission assignment and in accordance with approved programs of instruction requirements. Currently, the ranger unit from Fort Stewart schedules training requirements at McEntire Joint National Guard Base airfield, annually. Fort Jackson allows use of its restricted airspace, ranges, and training land in support of these training units (Fort Jackson, 2015). Today, Fort Jackson is the biggest and most active Initial Entry Training center in the entire U.S. Army, training 50% of all soldiers and 60% of the women entering the Army each year.

The South Carolina Army National Guard is licensed to use approximately 15,000 acres in the eastern area of Fort Jackson. This area is known as the McCrady Training Center.

Tracked vehicles at Fort Jackson are prohibited from travel on hard surface roads and road shoulders and are required limit their movement to known established tank trails and firebreak roads. Vehicles in general are not allowed to ford streams and may only use established culverted or bridged crossings.

Fort Jackson's air quality is attainment, and dust control is not a legal requirement.

The red-cockaded woodpecker, an endangered species, is present on the installation, and current training includes preservation and protection measures.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Jackson.

4.10. Fort Lee, Virginia

Fort Lee is a military school site. It does not currently have any ABCTs. There are no mechanized units, no live Explosive Ordnance Disposal (EOD) training, and no large caliber weapons firing. Training is predominantly limited to small arms firing, land navigation, inert EOD training, and Quartermaster activities ranging from food service to water purification to aerial delivery and fuel transfer.

The military mission on Fort Lee occupies most of the undeveloped land on the installation. This includes the range complex that harbors some of the installation's most sensitive natural communities, and the training areas within the cantonment area that include most of the remaining natural habitat on the installation. Sustainable land use is promoted both within the mission requirements, through rotation of training areas, and through installation programs and policies that ensure stewardship of natural resources in concert with the military mission.

Fort Lee participated in a Chesapeake Bay Site Assessment of installation surface waters that are tributaries to the Chesapeake Bay (Fort Lee, 2010).

Fort Lee's air quality status is attainment, and dust control is not a legal requirement.

There are small areas of sensitive species communities and small wetland footprints that have become institutionalized through the liberal use of environmental constraints maps and the incorporation of these maps into the training regimen, so there are few incidents of conflict with natural resources. No critical habitat for threatened or endangered species has been identified within the installation. The Northern long-eared bat is a threatened species present on the installation, and the Indiana bat is an endangered species found on the installation.

AMPV use at Fort Lee may be limited to training on a static vehicle for maintenance training purposes.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Lee.

4.11. Fort Riley, Kansas

Fort Riley is classified as a Tier 1 installation (installation with significant training value to Army commands and having high range and land capability) that has an Army-wide strategic and enduring training capability. Fort Riley supports National Guard and Reserve components.

Fort Riley facilities provide year-round support for live-fire exercises, maneuver training for mechanized/armored vehicles, attack helicopter gunnery, operation of rotary-wing aircraft, drone aircraft, small arms firing, mortar, artillery and tank firing exercises, engineer obstacle and demolition training, and maneuver training. These training activities are expected to remain stable. Current Fort Riley military assets include tanks, Bradley Fighting Vehicles, other tracked vehicles, wheeled vehicles, and rotary wing aircraft.

Every unit assigned to Fort Riley conducts rotational training. The most heavily used Maneuver Areas are occupied between 160-210 days per year. Flight operations occur daily.

Fort Riley has an Artillery and Mortar Impact Area and training live-fire ranges. Cantonment areas total approximately 11,000 acres, including Marshall Army Airfield (MAAF). The Douthit Gunnery Complex houses the Digital Multi-Purpose Range Complex (DMPRC) and Digital Multipurpose Training Range (DMPTR). Live-fire exercises involving mortars, artillery, and tanks occur throughout the year. These firing ranges for large caliber weapons are used extensively by units assigned to Fort Riley, active Army units assigned to other installations, Army Reserve units, National Guard units, and U.S. Air Force units (Fort Riley, 2020).

Fort Riley's air quality status is attainment, and dust control is not a legal requirement.

The Topeka shiner (*Notropis topeka (=tristis)*) and Piping Plover are endangered species found at Fort Riley.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Riley.

4.12. Fort Sill, Oklahoma

Fort Sill is home to the U.S. Army Fires Center of Excellence, an organization combining the U.S. Army Field Artillery Center and School; the U.S. Army Air Defense Artillery Center and School; the U.S. Army Electronic Warfare School; and one U.S. Army Training Center brigade. Principal operational units at Fort Sill include the 75th, 428th, and 434th Field Artillery Brigades, and the 30th and 31st Air Defense Artillery Brigades. Fort Sill is also one of the five locations used for Army Basic Combat Training (Leidos, Inc. 2018b).

Fort Sill's mission is to train soldiers and develop Field Artillery, Air Defense Artillery, and Electronic Warfare leaders; design and develop fire support for the force; support unit training and readiness; mobilize and deploy operating forces; and maintain installation infrastructure and services (Leidos, Inc. 2018b).

A wide variety of military equipment and weapon systems are used on the ranges and training areas at Fort Sill. Equipment varies from small arms (*e.g.*, the M9 pistol and the M16A2/M4 rifles) to heavy arms (*e.g.*, the 155-mm howitzer on the M109A7). In addition to equipment used by the Army, the Air Force uses the Falcon Bombing Range in the Quanah Range (on the western end of Fort Sill) for dropping 500- and 1,000-pound training munitions, for practicing laser targeting, and for strafing with 20-mm and 30-mm munitions.

The Air force also uses the West Range Impact Area for close air support training and for dropping live 500- and 1,000-pound munitions (Leidos, Inc. 2018b).

Current training operations at Fort Sill include artillery and mortar live-fire exercises, Unmanned Aircraft System operation, convoy- and platoon-level live-fire training, off-road vehicle operation and recovery, refueling, hand excavation of foxholes, small arms qualifying ranges, maneuvering and tactical field training, radar survey and launcher operations, and land navigation (Leidos, Inc. 2018b).

Maneuver damage is increasing on Fort Sill. Two contributing factors have been the implementation of a 'shoot and scoot' training philosophy, giving artillery greater freedom of maneuver, and the growth in the number of short-range fire capabilities of Paladin Howitzers, Multiple Launch Rocket Systems and High Mobility Artillery Rocket Systems (Fires Center of Excellence and Fort Sill, 2013).

Maneuver damage is mostly confined to areas outside impact areas that are suitable for cross-country maneuvers. These areas are very expansive and are characterized as having rolling topography and a high susceptibility to erosion whenever soil is exposed. Under these conditions, soil exposure is common and, in most cases, unavoidable when conducting maneuver training. Before the exposed areas become eroded and begin developing erosion gullies, it is critical that the areas are smoothed and seeded (Fires Center of Excellence and Fort Sill, 2013).

The movement of tracked and wheeled vehicles on unimproved maneuver trails and low-water crossings creates unstable roads and dusty or muddy conditions. Without remedial measures to stabilize the trail or crossing, and control soil erosion being generated by vehicular movement, trails and crossings degrade to the point where they are no longer useable or where there is a safety hazard. The continued operation of

vehicles in these conditions also contributes to the deposition of sediment in streams and degrades the air quality in which soldiers train (Fires Center of Excellence and Fort Sill, 2013).

Fort Sill's air quality is attainment, and dust control is not a legal requirement.

The Monarch butterfly (*Danaus plexippus*), a candidate species, is present on the installation. Other Federally Threatened and Endangered species include the red knot, piping plover, and whooping crane, and they have an ultra-low to low probability of occurring on the installation.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Sill.

4.13. Fort Stewart, Georgia

Fort Stewart and Hunter Army Airfield are the Army's world-class training and military armored power projection combination on the eastern seaboard of the United States. Training ranges for tanks, field artillery, helicopter gunnery, and small arms exist at Fort Stewart, in addition to drop zones (DZ), landing zones (LZ), and airstrips (Fort Stewart and Hunter Army Airfield, 2012).

Fort Stewart's air quality is attainment, and dust control is not a legal requirement.

The red-cockaded woodpecker, an endangered species, is present on the installation, and current training includes preservation and protection measures.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Stewart.

4.14. Joint Base Lewis McChord - Yakima Training Center, Washington

Yakima Training Center (YTC) provides military training facilities and logistical support for cross-country maneuvers and operational live-fire training opportunities. Major military land uses at YTC include the cantonment area with residential, administrative, commercial, light industrial, and open space uses; training areas with maneuver, impact, firing ranges, and other special uses; and the Selah Airstrip and Vagabond Army Airfield.

Military units use YTC to train brigade, battalion, company, platoon, and crew gunnery and maneuver. YTC is also used for air assaults, air drops (personnel and equipment), and special operations gunnery and maneuver.

Availability of the Multi-Purpose Range Complex (MPRC), artillery firing points adjacent to ground maneuver corridors, the Multi-Purpose Training Range (MPTR), and other ranges provide opportunities for multiple live-fire training iterations. Dominant ridgelines running east to west at YTC enable natural separation of smaller units by ridges and enable simultaneous maneuver in parallel valleys. This natural separation also allows concurrent gunnery and maneuver training, thereby maximizing unit training time.

Army units that train at YTC include Light Infantry, Mechanized Infantry, Armor and developing forces included in the IBCT transformation effort. IBCT forces utilize the

same resources as other forces and will be replaced in the future with development of other Light Armored Vehicles (LAV).

As a training facility, YTC provides the opportunity, facilities, and support for military units, including both active and reserve component forces, to enhance troop readiness and train for mobilization and post-mobilization exercises. All branches of the armed forces and allied military units train at YTC to sustain and improve unit readiness for both wartime and contingency operations.

YTC is within the area ceded by bands and Native American Tribes of the Yakama Nation pursuant to the Treaty of 1855. Yakama tribal members continue to hunt and gather plant resources at YTC and use the installation for traditional, religious, and ceremonial purposes.

Soils at YTC are mostly shallow light silt loams. They are characteristic of arid to semiarid climates. Soils are fragile and easily eroded. In addition, there are some minor areas of bottomland or alluvial soils, primarily near the Columbia River and in the cantonment area

Impacts to soil resources are chiefly attributable to military training activities. The two most important elements of land use that impact soil resources are disturbance and compaction. Disturbance is typically direct, such as excavations, whereas indirect disturbance includes intensive tracking, fire, and bivouac. Other disturbances include large burn areas or deteriorated and unmaintained roads and trails. Compaction is normally associated with land use during periods of high soil moisture content.

Fort Lewis (now part of Joint Base Lewis-McChord) has several applicable Records of Decision (ROD) that preserve the soil and water:

- Fort Lewis Stationing ROD. This ROD prohibits maneuver training on saturated soils, in part to limit soil compaction during periods of high soil moisture. Compaction can limit plant root penetration, decrease soil resiliency, and slow water infiltration.
- YTC Expansion ROD. This document prescribes specific mitigation actions to protect water resources. These include hardening of stream crossings, relocating roads outside Foster and Johnson Creeks, limiting access and use of riparian corridors and associated buffers, and suspended solids monitoring.
- Fort Lewis Stationing ROD. This document prescribes specific mitigation actions to protect water resources. These include hardening of stream crossings, relocation of roads outside riparian corridors, establishment of buffers, and suspended solids monitoring (Yakima Training Center, 2002).

Fort Lewis' air quality status is maintenance, and dust control is not a legal requirement.

The Chinook salmon (*Oncorhynchus (=Salmo) tshawytscha*) and steelhead fish (*Oncorhynchus mykiss*) are endangered fish species present on the installation; the golden eagle (*Aquila chrysaetos*) is also present.

Fielding of the AMPV is not anticipated to have a significant environmental impact on JBLM – Yakima Training Center.

4.15. Joint Base San Antonio - Fort Sam Houston / Camp Bullis, Texas

JBSA Fort Sam Houston JBSA Camp Bullis is an Army Support Activity training area and provides Base Operations Support and training support to Joint Base San Antonio partners (JBSA Randolph, JBSA Lackland, and JBSA Fort Sam Houston) to sustain their operational and institutional training requirements. No ABCTs will be fielded or are present. Camp Bullis has training facilities, firing ranges, simulation facilities, maneuver lands, and other training enablers and services that fully support the training requirements of their mission partners (JBSA Camp Bullis, n.d.).

Camp Bullis is located in an archeological and biological rich area within the Edward's Aquifer and has kept areas within the camp's borders partitioned off and indicates sensitive areas via signage. The ITAM office on Camp Bullis currently manages the training land.

Threatened and endangered species inventories have been completed on all JBSA locations through formal wildlife surveys and natural resources personnel observations. Threatened and endangered species found at both JBSA Fort Sam Houston and Camp Bullis are the golden-cheeked warbler and the red knot. Threatened and endangered species found specifically at Camp Bullis include the Fountain Darter (*Etheostoma fonticola*) and the Texas Wild-rice (*Zixania texana*). Endangered Karst species include the *Rhadine infernalis* Beetle, the Helotes mold beetle (*Batrisodes venyivi*), the Comal Springs riffle beetle (*Heterelmis comalensis*), the Government Canyon Bat Cave spider (*Tayshaneta microps*). Threatened and endangered salamander species include the San Marcos salamander (*Eurycea nana*) and Texas blind salamander (*Eurycea rathbuni*). Karst invertebrate species are monitored through annual in-cave surveys. JBSA monitors Golden-cheeked Warbler populations through annual point count surveys, territory monitoring, nesting searching, and banding. Reports are submitted annually to USFWS.

Training for the AMPV at Camp Bullis would take place on designated AMPV trails in the training area. AMPV use at JBSA-Fort Sam Houston would be limited to training on a static vehicle.

Fielding of the AMPV is not anticipated to have a significant impact at JBSA Fort Sam Houston or Camp Bullis.

4.16. Camp Dawson-Kingwood, West Virginia

Camp Dawson is facility in Preston County, West Virginia. It is home to Company C of 2nd Battalion, 19th Special Forces Group. Training opportunities that are unique to the site and its environs, such as the very rugged local terrain, have attracted U.S Army units and sister military services (both Active and Reserve) for many years (Camp Dawson-Kingwood (n.d.)).

The Northern Long-eared bat, a threatened species, and the Indiana Bat, an endangered species, are both found on the installation. Three other species are undergoing a 12-month status review – the little brown bat (*Myotis lucifugus*), the

tricolored bat (*Perimyotis subflavus*), and the Golden-winged warbler (*Vermivora chrysoptera*). The golden eagle is also found at Camp Dawson-Kingwood.

Dust control is not a legal requirement.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Camp Dawson-Kingwood.

4.17. Camp James A. Garfield Joint Military Training Center, Ohio

Formally known as Camp Ravenna, the installation consists of various small arms weapons ranges and permanent facilities to support individual and collective training events for both weekend and annual training. Recent improvements are a Fire and Movement Range, and the current construction of an Automated Record Fire Range. Camp James A. Garfield (CJAG) JMTC also features Training Aids, Devices, Simulators, and Simulations (TADSS), state-of-the-art digital training equipment that allows for realistic combat training without the logistic challenges of live-fire ranges (Camp Ravenna, n.d.).

Dust control is not a legal requirement.

The Bald Eagle is found on the installation. The northern long-eared bat and Monarch butterfly (a species of concern) are found on the installation. The tricolored bat is also found on the installation and is undergoing a 12-month status review.

Fielding of the AMPV is not anticipated to have a significant environmental impact at CJAG.

4.18. Camp McCain, Mississippi

The State of Mississippi developed and expanded Camp McCain as Mississippi's National Guard training post after it was surplused by the Army. 1,200 Guard and Reservists can be housed there, and it has several tactical training facilities and several rifle ranges on its 3000 acres (Camp McCain Training Center (n.d.)).

Dust control is not a legal requirement.

The Monarch butterfly and tricolored bat are found at Camp McCain and are undergoing 12-month status reviews.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Camp McCain.

4.19. Camp Perry Joint Training Center, Ohio

The training center is a National Guard training facility located on the shore of Lake Erie in northern Ohio, near Port Clinton. In addition to its regular mission as a military training base, Camp Perry Joint Training Center (JTC) also boasts the largest military outdoor rifle range in the world. The firing is done in the direction of the open water of the lake that lies just beyond an earthen berm and the targets. Currently, Camp Perry is home of the 213th Ordnance Company (Missile Support, Corps), the 372d Missile Maintenance Company (DS) Detachment 1, the 200th RED HORSE (Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers) Squadron (Ohio Air

National Guard), the Ohio Naval Militia (naval arm of the State of Ohio's Adjutant General's Department, and a part of Ohio's State Defense Forces) and the Ohio Military Reserve (the militia arm of Ohio's State Defense Forces (Camp Perry (n.d.)).

Dust control is not a legal requirement.

The bald eagle and the Northern long-eared bat, a threatened species, are found on the installation.

AMPV use at Camp Perry may be limited to training on a static vehicle for maintenance training purposes.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Camp Perry.

4.20. Camp Ripley, Minnesota

Camp Ripley features numerous ranges and state-of-the-art facilities to support unit training requirements. The post has a full complement of automated small arms and tank ranges as well as several specialized training facilities. The post also has maneuver training area capable of supporting a heavy brigade (Camp Ripley (n.d.)).

Dust control is not a legal requirement.

Both the Bald and Golden Eagle are present on the installation. Threatened and endangered species found at Camp Ripley include the gray wolf and northern long-eared bat, and the monarch butterfly is a candidate species found on the installation. The Blanding's turtle, little brown bat, tricolored bat, and golden-winged warbler are all located at Camp Ripley and are undergoing 12-month status review.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Camp Ripley.

4.21. Camp Shelby, Mississippi

Camp Shelby, Mississippi, is the largest state-owned and operated field training site in the United States. It is a training ground for the Abrams M1 Tank, Paladin Howitzers, and home to the 3rd Brigade 87th Division Training Support. Camp Shelby serves as a training site for National Guardsmen and Reservists from throughout the country.

Dust control is a legal requirement.

The natural resources section completed several key agreements in FY 2011 that will greatly assist in management of Threatened and Endangered Species at Camp Shelby. In coordination with the United States Forest Service (USFS) and the Mississippi Department of Wildlife, Fisheries and Parks, a Candidate Conservation Agreement was completed for the Black Pine Snake. Installation staff also completed a Stewardship Agreement with the USFS that outlines a seven-year plan for longleaf habitat restoration and improvement at Camp Shelby and within the Desoto National Forest. This is the first Stewardship Agreement of its kind that simultaneously benefits habitat restoration and military training requirements (Joint Force Headquarters, Mississippi National Guard Public Affairs Office, 2011).

Endangered species found on the installation include the red-cockaded woodpecker and Louisiana quillwort (*Isoetes louisianensis*), and threatened species include the gopher tortoise and the black pine snake (*Pituophis melanoleucus lodingi*). The Ravine sedge (*Carex impressinervia*), Eastern diamondback rattlesnake (*Crotalus adamanteus*), and hairy-peduncled beaked-rush (*Rhynchospora crinipes*) are found at Camp Shelby and are undergoing 12-month status reviews. The bald eagle is also found at Camp Shelby.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Camp Shelby.

4.22. Fort Indiantown Gap, Pennsylvania

Fort Indiantown Gap provides warfighters from all branches and components of our nation's armed forces with "commander-centric" training support. Our installation's ranges and training facilities offer full spectrum combat training opportunities for all types of units, preparing for nearly any contingency around the globe. Law enforcement and other homeland defense professionals are also able to develop and execute challenging training at our installation (Fort Indiantown Gap, (n.d.)).

Dust control is not a legal requirement.

The bald eagle and northern long-eared bat are found on the installation, along with the Monarch butterfly, a candidate species. Species undergoing 12-month status reviews that are found on the installation include the Spotted turtle (*Clemmys guttata*), wood turtle (*Glyptemys insculpta*), Northern red-bellied cooter (*Pseudemys rubriventris*), little brown bat, tricolored bat, golden-winged warbler, and regal fritillary (*Speyeria idalia*) butterfly.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Indiantown Gap.

4.23. Fort Pickett, Virginia

Fort Pickett is the home of the National Guard Maneuver Training Center. It is an Army National Guard training facility serving soldiers from the Regional National Guard and other military units and soldiers. The main mission of Fort Pickett is “to provide realistic and challenging training to the customers, to maintain physical security and force protection of their own facility in support of soldier readiness and deployment missions.” It has wide maneuver areas and has facilities such as a Live-Fire Range, Urban Assault, Training Villages, and other training facilities (Fort Pickett, 2020).

Dust control is a legal requirement.

Endangered species found at the installation include the Indiana bat, Michaux’s sumac, and the Roanoke logperch (*Percina rex*), and threatened species include the Northern long-eared bat, the yellow lance (*Elliptio lanceolata*), and the Atlantic pigtoe mussel (*Fusconaia masoni*). The Monarch butterfly is a candidate species also found on Fort Pickett. The Eastern diamondback rattlesnake and hairy-peduncled beaked-rush are

species found on the installation that are undergoing 12-month status reviews. The bald eagle is also found at Fort Pickett.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Fort Pickett.

4.24. Gowen Field, Idaho

Gowen Field hosts five Mission Types: Ground and Air Support Operations, Command and Control Mission, ISR Cyber Systems Mission, Flying Fighter Mission, and Tactical Air Control Party Mission. The 124th Air Support Operations Squadron operates out of Gowen Field, whose federal mission is to properly equip and train personnel in a high state of readiness for immediate tasking. Currently there is an active A-10 manned-flying mission at Gowen Field (Air National Guard (n.d.)).

Dust control is not a legal requirement.

Threatened species found at Gowen Field include the yellow-billed cuckoo, the slickspot peppergrass (*Lepidium papilliferum*), and the Monarch butterfly (a candidate species).

AMPV use at Gowen Field may be limited to training on a static vehicle for maintenance training purposes.

Fielding of the AMPV is not anticipated to have a significant environmental impact at Gowen Field.

4.25. McCrady Training Site, South Carolina

The McCrady Training Center occupies the eastern third of the Fort Jackson footprint. The state-of-the-art facilities and thorough training provided by our cadre, ensures our troops have the most efficient and useful military training available anywhere. Brigades participate in emergency preparedness exercises such as the National Disaster Medical System Exercise at Columbia Metropolitan Airport (Fort Jackson, 2015).

Dust control is not a legal requirement.

The red-cockaded woodpecker, smooth coneflower (*Echinacea laevigata*), rough-leaved loosestrife, Northern long-eared bat, and Monarch butterfly (a candidate species) are found on the training site, and the tricolored bat, bog spicebush (*Lindera subcoriacea*), and Carolina birds-in-a-nest (*Macbridea caroliniana*) are found on the training site and are undergoing 12-month status reviews. The bald eagle is also found at McCrady Training Site.

Fielding of the AMPV is not anticipated to have a significant environmental impact at McCrady Training Site.

4.26. MTA Limestone Hills, Montana

The primary mission of the Military Training Area - Limestone Hills (MTA-LH) is to train soldiers of the Montana Army National Guard and other units. MTA-LH provides the following training needs:

- A training area for National Guard and Reserve Forces

- A training area when needed, for active component forces including the US Marine Corps and US Navy
- Assistance for logistical support to units conducting inactive duty training and annual training
- A venue for the inactive duty training gunnery program to meet operating requirements
- Small arms and crew-served weapons qualification ranges and facilities
- Maneuver areas suitable for training infantry and other personnel in conducting dismounted exercises
- Organizational support maintenance facilities for units conducting training, and
- Training areas and facilities to local law enforcement agencies, civil defense organizations, public education institutions, and other civilian activities, as long as no interference occurs with existing military training activities.

The red-cockaded woodpecker, an endangered species, is present at MTA Limestone Hills, as is the bald eagle.

Fielding of the AMPV is not anticipated to have a significant environmental impact at MTA Limestone Hills.

4.27. Orchard Combat Training Center (OCTC), Idaho

The training center is located within the boundaries of the Nelson Snake River Birds of Prey National Conservation Area and has been used by the Idaho National Guard and Army Reserve since 1953. Vast terrain, world class ranges, and a four-season climate contribute to this being an ideal location to prepare BCTs and other units for combat in a tough and realistic training environment.

The mission is to provide year-round customer service through administrative, engineering, logistical, training, and operational support to assigned, attached, and transient or tenant units, and joint forces activities for up two brigade-sized elements. The Training Center expands and operates as a separate installation for US Forces Command to conduct mobilization and demobilization support activities for reserve component units. Additionally, it supports individual and collective training for multiple brigades

OCTC range facilities are focused on training for Armor and Stryker BCTs. Range facilities include small arms qualification ranges, grenade ranges, demolition ranges, live-fire shoot house, combined arms collective training facility, multiple purpose training range (capable of section gunnery), multi-purpose range complex-heavy (capable of platoon gunnery), and a digital air ground integration range. OCTC has maneuver areas containing land navigation courses, engineer dig sites, drop zones, and surveyed artillery firing points (Camp Orchard, n.d.).

Dust control is not a legal requirement.

Both the bald and golden eagles are found on the installation, along with the northern long-eared bat, a threatened species. The little brown bat is also found on the installation and is undergoing a 12-month status review.

Fielding of the AMPV is not anticipated to have a significant environmental impact at OCTC.

4.28. Volunteer Training Site, Smyrna, Tennessee

Volunteer Training Site (VTS) Command is composed of four military training centers across the state of Tennessee and NW Georgia. The VTS-Smyrna mission statement is to provide state-of-the-art training facilities in support of total force training requirements to sustain operational readiness and exceed mission requirements. Training needs are subject to change as mission requirements dictate. Maneuver training areas are available for squad, platoon, and company field exercises. Example actions are Bradley Fighting Vehicle requirement training, wheeled-vehicle dismounted training maneuvers, land navigation course exercises, night driving, rail loading, and aviation swing-load maneuvers. The site contains a small-arms firing range, an M203 grenade launcher practice range, a hand grenade practice course, bivouac sites, and an active 12-point land navigation course. The site is used for a variety of classroom and simulation training activities (Tennessee Army National Guard, 2012).

Dust control is a legal requirement.

The bald eagle is found at VTS Smyrna. The gray bat, Indiana bat, and northern long-eared bat are threatened or endangered species found on the installation. The little brown bat and tricolored Bat are found on the installation and are undergoing 12-month status reviews.

Fielding of the AMPV is not anticipated to have a significant environmental impact at VTS Smyrna.

5.0 SUMMARY OF POTENTIAL EFFECTS OF THE EVALUATED ALTERNATIVES

This section summarizes the impact conclusions for each Alternative by resource and identifies what, if any, additional requirements may need to be addressed, and it provides a summary of the impact analysis conclusions.

No significant environmental impacts are anticipated as a result of the no action alternative or the Preferred Alternative proposed in this PEA. Impacts to air quality as well as soil and geological resources would be less than significant as the Army would mitigate impacts by implementing already identified, approved, and proven measures through the Integrated Training Area Management plan. While biological and cultural resources could be affected, management strategies are in place to ensure that no significant impact results. For each resource analyzed, **Table 9** provides a summary of anticipated impacts using the categorization noted in Section 3.2 (Approach for Analyzing Impacts). Impacts are anticipated to be minimized through avoidance and through the implementation of BMPs and SOPs. These and any other environmental protection measures to avoid, minimize, rectify, reduce, eliminate, or compensate for impacts as a result of the Proposed Action are summarized in **Table 9**. Because direct,

indirect, and cumulative impacts for the proposed action are considered minimal or would be minimal when analyzed in conjunction with best management strategies and existing management plans, no mitigation at any one installation has been analyzed at this programmatic level.

For those locations where the environmental impacts are uncertain after reviewing this analysis, installation management staff should use the included Environmental Checklist in **Appendix A** for impact determinations and to ensure that all environmental resources are considered. If the environmental impacts are not covered by this analysis and the checklist indicates that there is an environmental impact, use this PEA as the framework for developing a Supplemental Environmental Assessment that captures the environmental impacts at the installation.

Table 8: Summary of Potential Effects of the Evaluated Alternatives

Installation – Proposed Action and Alternatives	Air Quality	Geological and Soil Resources	Water Resources	Biological Resources	Cultural Resources	Transportation and Traffic
Typical Installation – No Action Alternative	Minor	Moderate	Minor	Minor	Minor	Negligible
Typical Installation – Action Alternative: Field AMPV Units	Minor	Moderate	Minor	Minor	Minor	Negligible
Fort Benning – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Moderate/Less than Significant	Minor	Negligible
Fort Benning – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Moderate/Less than Significant	Minor	Negligible
Fort Bliss – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Bliss – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Bragg – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Bragg – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Campbell – No Action Alternative	Moderate/Less than Significant	Significant but Mitigatable	Minor	Minor	Minor	Negligible
Fort Campbell – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Significant but Mitigatable	Minor	Minor	Minor	Negligible
Fort Carson – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant and Beneficial	Minor	Minor	Minor	Negligible
Fort Carson – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant and Beneficial	Minor	Minor	Minor	Negligible
Fort Gordon -- No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Gordon – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Moderate/Less than Significant
Fort Hood – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Hood – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Irwin – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Irwin – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Jackson – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Jackson – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible

Installation – Proposed Action and Alternatives	Air Quality	Geological and Soil Resources	Water Resources	Biological Resources	Cultural Resources	Transportation and Traffic
Fort Lee – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Lee – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Riley – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Riley – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Sill – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Sill – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Stewart – No Action Alternative	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
Fort Stewart – Action Alternative: Field AMPV Units	Moderate/Less than Significant	Moderate/Less than Significant	Minor	Minor	Minor	Negligible
JBLM-YTC – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
JBLM-YTC – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
JBSA-FSH & JBSA Camp Bullis – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
JBSA-FSH & JBSA Camp Bullis – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Dawson-Kingwood, WV	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Dawson-Kingwood, WV	Minor	Minor	Minor	Minor	Minor	Negligible
Camp James A. Garfield JMTC, OH – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Camp James A. Garfield JMTC, OH – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Camp McCain, MS – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Camp McCain, MS – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Perry JTC, OH	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Perry JTC, OH	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Ripley, MD – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Ripley, MD – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Shelby, MS – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Camp Shelby, MS – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Indiantown Gap, PA – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Indiantown Gap, PA – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Pickett, PA – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Fort Pickett, PA – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible

Installation – Proposed Action and Alternatives	Air Quality	Geological and Soil Resources	Water Resources	Biological Resources	Cultural Resources	Transportation and Traffic
Gowen Field, ID – No Action Alternative	Minor	Minor	Minor	Minor	Minor	Negligible
Gowen Field, ID – Action Alternative: Field AMPV Units	Minor	Minor	Minor	Minor	Minor	Negligible
McCrady Training Center, SC	Minor	Minor	Minor	Minor	Minor	Negligible
McCrady Training Center, SC	Minor	Minor	Minor	Minor	Minor	Negligible
MTA Limestone Hills, MT	Minor	Minor	Minor	Minor	Minor	Negligible
MTA Limestone Hills, MT	Minor	Minor	Minor	Minor	Minor	Negligible
Orchard Combat Training Center, ID	Minor	Minor	Minor	Minor	Minor	Negligible
Orchard Combat Training Center, ID	Minor	Minor	Minor	Minor	Minor	Negligible
Volunteer Training Site, TN	Minor	Minor	Minor	Minor	Minor	Negligible
Volunteer Training Site, TN	Minor	Minor	Minor	Minor	Minor	Negligible

Table 9: Summary of Environmental Protection Measures to be Adopted

Resource	Environmental Protection Measures
Air Quality	Dust Suppression Management Controls Apply palliatives to abate dust generation Complete air emissions calculations to determine emission generation
Geological and Soil Resources	Apply palliatives for dust suppression Rotate use of affected areas to allow for reparative and regenerative processes Limit access and activities Redistribute land use Modify kinds of uses Alter the behavior of use Manipulate the natural resources for increased durability Follow Sedimentation and Erosion Control Plans Follow practices stated in the Integrated Natural Resource Management Plan
Water Resources	Storm Water Pollution Prevention Plan Storm Water Construction Permits Total Maximum Daily Load limits Sedimentation and Erosion Control Plan Clean Water Act NPDES Program
Biological Resources	Follow practices stated in the Integrated Natural Resource Management Plan, Biological Opinions, and Integrated Training Area practices
Cultural Resources	Follow practices stated in the Integrated Cultural Resource Management Plan, Programmatic Agreements, Memorandum of Agreements, and Integrated Training Area practices
Transportation and Traffic	Traffic Surveys Road closure for limited times Limited access

6.0 REFERENCES

7 USC § 136 *et seq.* Federal Insecticide, Fungicide, and Rodenticide Act of 1996, as amended.

7 CFR Part 658. Farmland Protection Policy Act.

7 USC §§ 4201-4209. Farmland Protection Policy.

10 USC § 2667. Leases: non-excess property of military departments and Defense Agencies.

10 USC § 2684. Cooperative agreements for management of cultural resources.

10 USC § 2684a. Agreements to limit encroachments and other constrains on military training, testing, and operations.

10 USC § 2911. Energy performance goals and master plan for the Department of Defense. 2009.

15 USC § 2601 *et seq.* Toxic Substances Control Act of 1976, as amended.

16 USC §§ 470aa-470mm. Archaeological Resources Protection Act of 1979, as amended.

16 USC §§ 470aaa *et seq.* Paleontological Resources Preservation Act of 2009

16 USC § 668 *et seq.* Bald and Golden Eagle Protection Act of 1940, as amended.

16 USC § 670 *et seq.* Sikes Act of 1960, as amended.

16 USC § 703 *et seq.* Migratory Bird Treaty Act of 1918, as amended.

16 USC § 1361 *et seq.* Marine Mammal Protection Act of 1972, as amended.

16 USC §§ 1451-1464, Coastal Zone Management Act of 1972, as amended.

16 USC § 1531 *et seq.* Endangered Species Act of 1973, as amended.

16 USC § 2901 *et seq.* Fish and Wildlife Conservation Act (“Nongame Act”) of 1980, as amended.

25 USC § 3001 *et seq.* Native American Graves Protection and Repatriation Act of 1990, as amended.

29 USC § 651 *et. seq.* Occupational Safety and Health Act of 1970, as amended.

32 CFR Part 179. Munitions Response Site Prioritization Protocol (MRSPP).

32 CFR Part 651. Environmental Analysis of Army Actions.

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42 USC § 116. Emergency Planning and Community Right-to-Know Act of 1986, as amended.

42 USC § 300f *et seq.* Title XIV of The Public Health Service Act: Safety of Public Water Systems (Safe Drinking Water Act) of 1974, as amended

42 USC § 1996. American Indian Religious Freedom Act of 1978, as amended (Protection and preservation of traditional religions of Native Americans)

42 USC § 4321 *et seq.* National Environmental Policy Act of 1969, as amended.

42 USC § 4901 *et seq.* Noise Control Act of 1972, as amended.

42 USC § 6901 *et seq.* Resource Conservation and Recovery Act of 1976, as amended.

42 USC § 7401 *et seq.* The Clean Air Act of 1970, as amended.

42 USC § 9601. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, "Superfund", as amended.

42 USC § 11001 *et seq.* Emergency Planning and Community Right-to-Know Act of 1986, as amended.

42 USC § 13201 *et seq.* Energy Policy Act of 2005.

43 CFR Part 3. Preservation of American Antiquities.

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50 CFR § 10.13. List of Migratory Birds.

54 USC § 300101 *et seq.* The National Historic Preservation Act of 1966, as amended.

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APPENDIX A: Environmental Checklist for Armored Multi-Purpose Vehicle (AMPV) Fielding

The checklist in this appendix supports referencing the Programmatic Environmental Assessment (PEA) for the AMPV and the associated Finding of No Significant Impact (FONSI) for fielding the AMPV at various installations. The checklist ensures compliance with the President's Council on Environmental Quality (CEQ) guidance (40 CFR Parts 1500–1508) and the Army's National Environmental Policy Act (NEPA) implementing regulations (32 CFR Part 651). The checklist facilitates the consideration of environmental effects from fielding the AMPV and provides a framework for identifying installation specific NEPA requirements.

Installations tiering from this PEA and associated Finding of No Significant Impact (FONSI) are to use this checklist to determine whether reliance on the PEA (and possibly other NEPA analyses and one or more categorical exclusions (CXs)) are appropriate, or whether additional NEPA analysis is needed before implementing fielding.

If the installation can respond "no" to each of the statements in the checklist below, then generally no further NEPA analysis would be required, and the action would likely qualify for a record of environmental consideration (REC).

When a project qualifies for a REC, the installation REC should cite 32 CFR § 651.10(c)(2) ('action is adequately covered within an existing environmental assessment or environmental impact statement') and name this PEA and associated FONSI. If the REC is also based on other environmental analyses and/or CX(s) under 32 CFR Part 651, the REC should name the other applicable analyses and their associated FONSI or Record of Decision and cite any applicable CX(s). The completed checklist should be attached to the installation's REC.

If the installation responds "yes" to one or more questions in the checklist, it can reconsider the proposed plan or the specific activity that would lead to a "yes" response to see whether the effect on the resource can be avoided and the answer changed to "no".

If a "yes" or "maybe" response to any checklist item cannot be changed to a "no," then additional environmental analysis may be required as part of an installation-level NEPA process. If, upon investigation of each "yes" and "maybe" response on the checklist, the installation determines that no further environmental analysis is required and that a REC is appropriate, documentation of the results of the investigation should be maintained with the REC and completed checklist.

If the installation concludes that additional NEPA analysis is necessary, 32 CFR Part 651 requires it be prepared before any irreversible and irretrievable commitments of resources occur for the proposed action. The plan specific NEPA process should be streamlined by tiering off this PEA, with the tiered document focused only on those resource areas where specific considerations require additional NEPA analysis of potential impacts. Within the tiered analysis (e.g., within an appendix), as it relates to resource areas for which no further analysis was needed, documentation should be included regarding the completed checklist and those "yes" and "maybe" investigations which concluded that a resource area did not need further analysis because of the proposed action.

This checklist is to enable the identification of the documentation required to meet NEPA requirements. Requirements to comply with other federal and state environmental and/or energy laws and regulations are to be adhered to, as appropriate and applicable. These may include, for example, those requiring resource-specific consultations with other federal, state, and Tribal governments and agencies (such as consultation under the Endangered Species Act (ESA) or National Historic Preservation Act (NHPA)) or completing NEPA-like requirements of the state, if applicable.

Resource Area and Questions	***Check the appropriate response:***
Land Use	
Will any action taken to field the AMPV conflict with an installation planning document (master plan, land use plan, etc.)?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV create a land use incompatibility?	☐Yes ☐No ☐Maybe
Airspace	
Will any action taken to field the AMPV require a change to an Air Installation Compatible Use Zone, Clear Zone, or Accident Potential Zone designation for the installation?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV cause a change in existing airspace use?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV create a need to modify an airspace permit or related memorandum of agreement or military training route?	☐Yes ☐No ☐Maybe
Aesthetics and Visual Resources	
Will any action taken to field the AMPV adversely affect a valued scenic view or sensitive aesthetic or visual resource?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV conflict with the Installation Design Guide or Common Installation Picture?	☐Yes ☐No ☐Maybe
Air Quality	
Will any action taken to field the AMPV contribute to a change in the air quality compliance status in the region (e.g., from attainment to nonattainment)?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV violate the installation's air operating permit?	☐Yes ☐No ☐Maybe

Resource Area and Questions	***Check the appropriate response:***
Noise	
Will any action taken to field the AMPV involve substantial noise generation within 800 feet of a sensitive noise receptor for a prolonged period?	☐Yes ☐No ☐Maybe
Substantial noise generation is considered a doubling of the normal sound level, or an increase of 10 decibels at the noise receptor. *Sensitive noise receptors* include residences, hospitals, churches, and schools, and/or sensitive wildlife populations, including threatened or endangered species. A *prolonged period* could be anywhere from a month to a year or longer, depending on the noise receptor.	
Geological and Soil Resources	
Will any action taken to field the AMPV be conducted in a manner that conflicts with accepted state best management practices (BMPs) applicable to the activity (e.g., forestry BMPs for timber harvesting, wetlands, and riparian area protection BMPs)?	☐Yes ☐No ☐Maybe
Will any action taken to field the AMPV involve construction activities on highly erodible soils?	☐Yes ☐No ☐ Maybe
Will any action taken to field the AMPV disturb contaminated soil?	☐ Yes ☐ No ☐ Maybe
Water Resources	
Will any action taken to field the AMPV violate a National Pollutant Discharge Elimination System (NPDES) stormwater permit?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV modify a floodplain such that the floodplain's natural and beneficial values are diminished?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV occur completely or partially within a floodplain, requiring implementation of Executive Order 11988, possibly resulting in a Finding of No Practicable Alternative?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV cause an exceedance of a Total Maximum Daily Load?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV cause a change in the impairment status of a surface water?	☐Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV result in unpermitted direct impacts to waters of the U.S., regulated recharge zones, and/or groundwater aquifers?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV occur on or within jurisdictional wetlands or require additional surveys to identify and delineate jurisdictional wetlands?	☐ Yes ☐ No ☐ Maybe

Resource Area and Questions	***Check the appropriate response:***
Will any action taken to field the AMPV cause the unpermitted loss or destruction of more than 1 acre of jurisdictional wetlands?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV affect a coastal zone regulated by the Coastal Zone Management Act (CZMA), requiring a CZMA consistency evaluation that has not yet been completed?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV require substantial modification of the installation's storm water discharge prevention plan?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV depend on groundwater resources that are stretched to or beyond their capacity, or cause or worsen a problem of brackish or saltwater intrusion?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV be done on a site known to contain contamination and be done in a way that could cause surface water or groundwater contamination or violate water quality regulations?	☐ Yes ☐ No ☐ Maybe
Biological Resources	
Will any action taken to field the AMPV adversely affect a federally protected plant or animal species?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV contradict an installation-specific tree replacement or other natural resources protection policy or not comply with any previously agreed upon NEPA mitigation actions for natural resources protection?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV not comply with the Endangered Species Act, Migratory Bird Treaty Act, Marine Mammal Protection Act, and Bald and Golden Eagle Protection Act, including compliance with any previously agreed upon NEPA mitigation actions? *(Note: All required U.S. Fish and Wildlife Service or National Marine Fisheries Service informal or formal consultation must be completed prior to implementing the proposed plan.)*	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV result in an unauthorized "take" of a state-protected species for which the installation is required to comply with the associated legal and regulatory requirements of the state?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV include activities in biological sensitive areas other than those mentioned above?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV trigger a survey for one or more protected species, such as threatened or endangered species protected under the Endangered Species Act? *(Note: A YES means that the appropriate biological resource survey does not exist for all or part of the project area.)*	☐ Yes ☐ No ☐ Maybe

Resource Area and Questions	***Check the appropriate response:***
Will any action taken to field the AMPV cause a substantial decrease in the relative percentage of any one vegetation type (native to the region) on the installation, particularly a vegetation type in the region that is already highly fragmented because of human activity?	☐ Yes ☐ No ☐ Maybe
Cultural Resources	
Will any action taken to field the AMPV disturb buildings or structures that are eligible for or listed on the National Register of Historic Places (NRHP)?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV adversely affect a historic district that is eligible for or listed on the NRHP?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV trigger a survey for cultural resources? *(Note: A YES means that a cultural resources survey does not exist for all or part of the construction area.)*	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV have an adverse effect on a NRHP-listed or -eligible historic property that is unlikely to be able to be avoided or mitigated? *(Note: All required NHPA Section 106 consultation with the State Historic Preservation Office [SHPO], Advisory Council on Historic Preservation [ACHP], Native American Tribes, and other interested parties must be completed prior to commencing with the proposed project.)*	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV prevent the traditional use of sacred or ceremonial sites or resources by federally recognized Native Americans, Alaska Natives, or Native Hawaiians? *(Note: All required NHPA Section 106 consultation with SHPO, ACHP, Native American Tribes, and other interested parties must be completed prior to commencing with the proposed project.)*	☐ Yes ☐ No ☐ Maybe
Socioeconomics	
Will any action taken to field the AMPV cause a long-term loss or displacement of recreational opportunities and resources?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV have a disproportionate adverse economic, social, or health impact on a minority or low-income population?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV create a disproportionate environmental health or safety risk to children?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV result in substantial loss or displacement of recreational opportunities and resources (e.g., hunting and fishing) relative to the baseline?	☐ Yes ☐ No ☐ Maybe

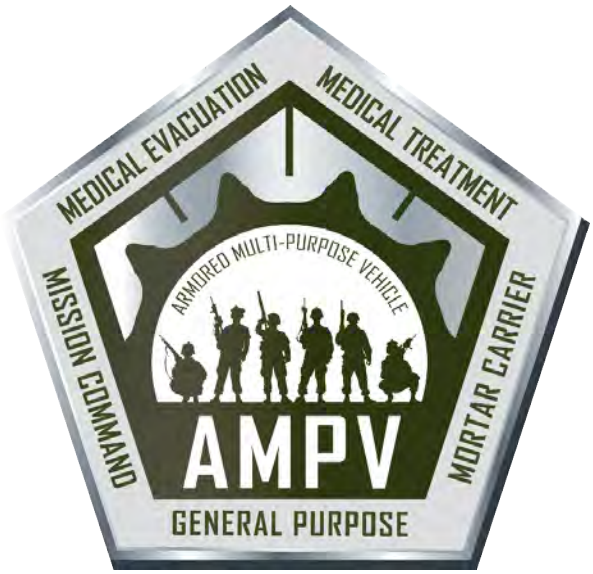
Resource Area and Questions	***Check the appropriate response:***
Will any action taken to field the AMPV be accomplished adjacent or near a low-income or minority population area that is one of only a few residential areas bordering the installation that are primarily occupied by low-income or minority populations?	☐ Yes ☐ No ☐ Maybe
Transportation and Traffic	
Will any action taken to field the AMPV create any long-term road closures or traffic delays?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV require large construction and delivery vehicles to use roads that are already congested?	☐ Yes ☐ No ☐ Maybe
Utilities	
Will any action taken to field the AMPV cause an exceedance of the existing capacity of an element of infrastructure?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV violate a regulatory limit of any infrastructure system (e.g., wastewater discharge)?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV be incompatible with the existing installation or regional electrical grid system?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV create utility shortages (electricity, natural gas, water, telecommunication service, wastewater management services, solid waste management service [non-hazardous], and other essentials) to local communities, homes, and businesses for a length of time that would affect health, welfare, and economic viability?	☐ Yes ☐ No ☐ Maybe
Hazardous Materials and Hazardous Wastes	
Will any action taken to field the AMPV disturb a known or create a new contaminated site that would be subject to regulatory control?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV cause a violation of a law or regulation governing hazardous materials or wastes or an installation hazardous waste permit?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV require new or substantially modified facilities for waste petroleum, oil, and lubricant products storage to be compliant with local/state/federal regulations?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV require a substantial change in the quantity of a hazardous material or waste that needs to be transported, stored on the installation, or disposed of?	☐ Yes ☐ No ☐ Maybe
Will any action taken to field the AMPV require substantial modification of the installation's Spill Prevention, Control and Countermeasures Plan?	☐ Yes ☐ No ☐ Maybe

Resource Area and Questions	***Check the appropriate response:***
Human Health and Safety	
Will any action taken to field the AMPV require substantial modification of the installation's health and safety plan?	☐ Yes ☐ No ☐ Maybe
Additional Actions/Projects That May Alter Assessed Impacts	
Are there other actions underway or proposed whose effects—when combined with the potential effects of implementing the proposed plan—could have a significant adverse cumulative effect on human health or the environment?	☐ Yes ☐ No ☐ Maybe

APPENDIX B: Lifecycle Environmental Assessment and Finding of No Significant Impact

Armored Multi-Purpose Vehicle (AMPV)

Life Cycle Environmental Assessment (LCEA) and Finding of No Significant Impact (FONSI)



July 2020

Prepared by:

Product Manager (PdM) AMPV

Distribution A. Approved for public release: distribution unlimited.

AMPV LCEA and FONSI

July 2020

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Executive Summary

This Life Cycle Environmental Assessment (LCEA) has been developed by the United States (U.S.) Army in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended; the President's Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations (CFR) 1500-1508); and Department of the Army (DA) 32 CFR 651 *Environmental Analysis of Army Actions*; Final Rule March 29, 2002, which implements NEPA and CEQ regulations. Its purpose is to inform decision-makers, fielding facilities, and the public of the potential environmental consequences of the proposed action and alternatives.

The proposed action is the execution of the Armored Multi-Purpose Vehicle (AMPV) program which includes production, testing, training, fielding and operation, maintenance, and demilitarization and disposal (D & D) of AMPV vehicles. The AMPV will replace the M113 in the Armored Brigade Combat Team (ABCT) at Brigade and below and provide support across the range of military operations (ROMO). The AMPV will provide improved force protection, survivability, mobility, situational awareness, sustainment, and capability for future growth. The AMPV will have five variants: General Purpose (GP), Mission Command (MCmd), Medical Treatment (MT), Medical Evacuation (ME), and Mortar Carrier (MC). The AMPV will provide a platform with force protection, survivability, mobility, sustainability, and maintainability comparable to the ABCT vehicles that the AMPV variants support in the formation. The Product Manager (PdM) AMPV awarded one contract to BAE Systems for the Engineering, Manufacturing, and Development (EMD) Phase with Low-Rate Initial Production (LRIP) options, which includes the procurement of prototype vehicles through full and open competition. The total projected AMPV quantity is approximately 2,000-3,000 vehicles.

This LCEA analyzes the potential environmental consequences of the Proposed Action and the No-Action Alternative. Environmental Resource Area (ERA) analyses include air quality, water quality, soil resources, land use, socioeconomics, hazardous materials and wastes, non-hazardous wastes, noise, transportation, biological resources, cultural & historical resources, and public health and safety. The analysis included in this LCEA is limited to ERAs at a programmatic level, meaning it includes a review of potential impacts that are similar at all or nearly all locations where production, testing, training, fielding, operation, maintenance, and D & D of the AMPV will occur. Some ERAs may require additional, site-specific NEPA analysis by receiving organizations based on the unique environmental conditions at the site or specific activities planned at the installation.

At a programmatic level, environmental risks associated with the AMPV are expected to be minimal over the system lifecycle. Based on this LCEA, minimal environmental impacts to air quality, water quality, soil resources, land use, hazardous materials and waste, non-hazardous waste, noise, transportation, and health and safety are anticipated at locations where the AMPV is produced, tested, operated, maintained, and demilitarized or disposed of. The environmental impacts related to AMPV are expected to be typical of tracked, combat vehicle systems within the Army inventory.

Careful adherence to Federal, State, military, and local environmental regulations, such as installation processes, spill contingency plans and pollution prevention plans, as well as procedures for testing, training, operation, maintenance, and D & D, preclude any potential significant environmental impacts associated with execution of the proposed action.

No cumulative environmental impacts are anticipated. In addition, there are no Executive Order (E.O.) 12898 Environmental Justice concerns since the proposed action does not result in any disproportionately high and adverse human health and environmental effects on minority or low-income populations. As a result, the preparation of an Environmental Impact Statement is not required and a Finding of No Significant Impact (FONSI) has been prepared and included in Appendix B of this assessment.

Table of Contents

1.0 Introduction

The Product Manager (PdM) Armored Multi-Purpose Vehicle (AMPV) has prepared this Life Cycle Environmental Assessment (LCEA) in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended; the President's Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations (CFR) 1500-1508); and Department of the Army (DA) 32 CFR 651 *Environmental Analysis of Army Actions*; Final Rule March 29, 2002. This LCEA will inform decision- makers and the public of the potential environmental consequences of the proposed action and alternatives identified in the LCEA.

The AMPV has been designated as an Acquisition Category (ACAT) IC program with the Army Acquisition Executive (AAE) serving as the Milestone Decision Authority (MDA) for the program. PdM AMPV has responsibility for all Environmental, Safety, and Occupational Health (ESOH) requirements for the AMPV program. PdM AMPV has conducted NEPA analyses and prepared this LCEA in support of the program's Low Rate Initial Production (LRIP) phase. The AMPV program reached Milestone C in January 2019.

This LCEA addresses the potential environmental impacts of the proposed action of production, testing, training, fielding and operation, maintenance, and demilitarization and disposal (D & D) of associated vehicles from the AMPV program.

2.0 Document Scope

This LCEA identifies, documents, and evaluates the direct, indirect, and cumulative effects of the Proposed Action pertaining to the production, testing, training, fielding and operation, maintenance, and D & D of the AMPV. Additionally, this LCEA evaluates the Proposed Alternative and No-Action Alternative potential impacts and their significance. The analysis is based upon impacts to Environmental Resource Areas (ERAs). Due to the fact that several Army organizations at multiple locations will receive the AMPV, the analysis included in this LCEA is limited to ERAs at a programmatic level, meaning it will include a review of potential impacts that are similar at all or nearly all locations where production, testing, training, fielding and operation, maintenance, and D & D of the AMPV will occur. In accordance with (IAW) 32 CFR 651, this LCEA documents the general environmental effects of all aspects of the program and the specific effects for all activities for which the PdM AMPV is the proponent.

Specific ERAs analyzed within this LCEA include air quality, water quality, soil resources, land use, socioeconomics, hazardous materials & wastes, non-hazardous waste, noise, transportation, biological resources, cultural & historical resources, and public health & safety.

Some ERAs may require additional, site-specific NEPA analyses conducted by receiving organizations based on the unique environmental conditions at the site or specific activities planned at the installation. Installation personnel are responsible for determining whether additional site-specific NEPA documentation is required. The site-specific environmental analysis can be accomplished through several avenues: a Categorical Exclusion (CX); a Record of

Environmental Consideration (REC), which shows the applicability of a CX and/or the determination that the proposed action is sufficiently covered in an existing NEPA document; a supplemental Environmental Assessment (EA) if specific issues need further analyses,

or an Environmental Impact Statement (EIS) if site-specific impacts appear significant. In any case, the analyses within this LCEA, if applicable, need not be duplicated, but can be incorporated by reference.

For this LCEA, the proposed action and alternatives are evaluated using three types of impact categories: an insignificant impact results from an action that will have no noticeable impact to the resource area, a minimal impact results from an action that will have an impact on an ERA (but the impact will be temporary and managed through the use of existing plans and resources), and a significant impact results from an action that will have an impact on an ERA that cannot be rectified or will result in a facility or installation being in violation of its permits.

It should be noted that significant changes to future AMPV configurations during future phases that are not addressed in this LCEA may require further NEPA analysis and documentation, either in the form of a supplemental EA, REC, or EIS.

The findings from this LCEA have been published in a public notice and was made available for a 30 day public review (Appendix D).

3.0 Purpose and Need for Armored Multi-Purpose Vehicle

The AAE terminated production of the M113 Family of Vehicles (FoV) on 11 June 2007. The AMPV will replace the M113 in the Armored Brigade Combat Team (ABCT) and provide support across the range of military operations (ROMO). The AMPV will provide improved force protection, survivability, mobility, situational awareness, sustainment, and capability for future growth. A Capability Development Document (CDD) was approved in 2013 and identifies the core capabilities required of the AMPV to support Joint Forces across a range of military operations conducted in a wide range of terrains and environments.

4.0 Description of the Proposed Action

4.1 Program Overview

The PdM AMPV awarded one contract to BAE Systems for the Engineering, Manufacturing and Development (EMD) Phase procurement of prototype vehicles through full and open competition. PdM AMPV subsequently awarded BAE Systems a LRIP contract in January 2019. A full-rate production (FRP) decision for the program is scheduled for fiscal year (FY) 2022. The total Army procurement objective is approximately 2,000-3,000 vehicles.

4.2 AMPV System Description

The AMPV will be an armored, tracked vehicle which will provide a platform with sufficient protection, mobility, and network enabled function to maneuver with and support combat vehicles throughout the range of military operations.

The AMPV will have five variants:

- General Purpose (GP)

- Mission Command (MCmd)
- Medical Treatment (MT)
- Medical Evacuation (ME)

- Mortar Carrier (MC)

The AMPV variants will operate in terrain classified in two categories: improved surfaces and unimproved surfaces. Improved surfaces are primary and secondary roadways consisting of hardened surfaces subject to periodic maintenance. This includes surfaces ranging from paved, high speed roads in excellent condition, as well as rutted and pot-holed gravel roads. Unimproved surfaces are trails and cross-country "natural" surfaces with no man-made improvements or routine maintenance, and are subject to variances due to weather. Unimproved terrains include, but are not limited to, deserts, grasslands, sand, swamps, forests, tropical jungles, mountains, shallow rivers, and salt water beaches.

The AMPV will have the capability for transportation by land, sea, and air. The AMPV weight and ground pressure will be similar to the currently fielded Bradley Fighting Vehicle System. Tables 4.2-1 and 4.2-2 present information such as physical characteristics, fuel economy, and petroleum, oil, and lubricant (POL) requirements for the AMPV.

Table 4.2-1: AMPV Physical Characteristics

	GP	MCmd	MT	ME	MC
Fuel Tank Capacity (gallons)	175-250				
Physical Dimensions	-	-	-	-	-
Length (in)	297.2	298	299	299	300
Width (in)	144	144	144.8	144.8	148
Height (in)	128.1	128.1	120	120	142

Table 4.2-2: POL Standards and Capacities

Military Specification / Standard	Description	Capacity
MIL-DTL-83133	JP8 / F24 (Primary)	175-250 Gallons
ASTM D975	Diesel Fuel	175-250 Gallons
CID A-A-52624	Engine Coolant	25 Gallons
MIL-PRF-2104	Engine Oil	11 Gallons
SAE J2360	Gear Oil (Final Drive)	12 Quarts
MIL-PRF-2104	Transmission Oil	13.5 Gallons
MIL-PRF-5606	Hydraulic Fluid	< 1 Gallon
	Refrigerant (R-134a)	10-11 lbs
MIL-G-21164	Grease	

A-A-59664	Windshield Washer Solvent	

4.2.1 General Purpose Description

The GP vehicle replaces the M113 in the ABCT organization and provides protected transport for Soldiers while maneuvering with combat vehicles in support of tactical operations. A main function of the GP vehicle is to support First Sergeant tasks such as Logistics Package escort, emergency resupply, and Casualty Evacuation (CASEVAC). In the CASEVAC role, the GP vehicle is reconfigurable to accommodate one litter (stretcher) without displacing the crew or passengers. The GP can host any of the Army's current small and heavy machine guns.

4.2.2 Mission Command Description

The MCmd vehicle replaces the M1068A3 Command Post, the M577 Fire Direction Center (FDC), and the M113 Tactical Air Control Party (TACP) in the ABCT organization. The MCmd vehicle provides advanced communication capabilities (voice & data) and analysis tools that are a main component of the ABCT formation network. The MCmd vehicle's improved mobility and survivability allows it to support Commanders' operational needs at any location in the operational area. The MCmd vehicle is interoperable with current and future communications systems to ensure a common operating picture and connectivity across all echelons throughout the area of operations. The MCmd can host any of the Army's current small and heavy machine guns.

4.2.3 Medical Treatment Description

The MT vehicle replaces the M577A3 in the ABCT organization. The AMPV MT integrates medical treatment support into the ABCT by providing greater survivability, mobility and force protection to conduct required medical tasks in ABCT operational environments. The MT vehicle provides a specifically designed, environmentally controlled, area for the unit surgeon, physician's assistant and medical staff to provide immediate medical care of casualties or life stabilizing triage for casualties prior to evacuation to more capable hospital facilities.

4.2.4 Medical Evacuation Description

The ME vehicle replaces the M113 medical evacuation vehicle in the ABCT organization and integrates medical support into maneuver unit operations by providing the protected mobility and immediate casualty medical care required in tactical environments. The ME vehicle capabilities include emergency care en route, in a protected, environmentally controlled compartment, enhanced by specific lighting and a specialized medical mission equipment package.

4.2.5 Mortar Carrier Description

The MC vehicle replaces the M1064 Mortar Carrier in the ABCT organization and provides immediate, responsive, and heavy mortar fire utilizing the M121 mortar system during fast-paced, offensive operations. The MC vehicle also provides accurate and lethal high-angle fires to support operations in complex terrain and urban environments.

4.3 Production

AMPV vehicles will be built using new hulls and a mix of reclaimed combat vehicle components and new components. The AMPV vehicle production will be done at two BAE facilities (York, Pennsylvania and Aiken, South Carolina) and at Red River Army Depot (RRAD) near Texarkana, Texas.

4.4 Testing and Evaluation

EMD and LRIP testing will utilize approximately 30-50 vehicles and will include the following:

- Reliability, Availability, and Maintainability (RAM)
- Limited User Test (LUT)
- Logistics Demonstration
- Live Fire
- Electromagnetic Environmental Effects (E3)
- Production Qualification Test (PQT)
- Nuclear Weapons Effects
- Delta Log Demo
- Contractor Test and Evaluation
- Tropics Regions Testing
- Extreme Cold Natural Environmental Testing
- Initial Operation Testing

Testing will occur at the following locations:

- BAE Systems in Sterling Heights, Michigan
- Aberdeen Proving Ground (APG) in Aberdeen, Maryland
- Yuma Proving Ground (YPG) in Yuma, Arizona
- White Sands Missile Range (WSMR) in New Mexico
- Electronics Proving Ground (EPG) in Huachuca, Arizona
- Fort Hood in Killeen, Texas
- Fort Greely in Alaska

Test and Evaluation locations are responsible for executing all testing activities in accordance with Federal, State, and local environmental laws and regulations.

4.5 Training

The AMPV training plan currently consists of multiple types of training during various phases of the program. The following training activities are currently planned:

- Developmental Test Tester Training
- LUT Training
- Crew and Maintainer Log Demo Training
- Instructor and Key Personnel Training (I&KPT) Training and Professional Military Education Courses
- Initial Operation Test & Evaluation (IOT&E) Training
- New Equipment Training (NET)
- Individual, Unit, and Crew Training

The training activities will occur at the following locations:

- APG
- YPG
- EPG

- Fort Benning in Georgia
- Fort Sill in Oklahoma
- Fort Sam Houston in San Antonio, Texas
- Fort Gordon in Georgia
- Fort Lee in Prince George County, Virginia
- Camp Shelby in Hattiesburg, Mississippi
- Fort Hood in Killeen, Texas
- BAE Systems in Sterling Heights

BAE Systems developed AMPV operator and maintainer technical manuals (TM) IAW MIL-STD-40051. TMs are currently being validated by BAE and will be verified by the Government to ensure technical accuracy, safety, usability, and completeness. Field and Sustainment levels of maintenance will be called out in the Maintenance Allocation Chart found in the Operator and Field Maintenance Interactive Electronic Technical Manual (IETM).

4.6 Fielding & Operations

A Material Fielding Plan has been developed for the program. It is known that the AMPV will be fielded to multiple locations within the U.S. and abroad. The AMPV will perform an assortment of activities at the fielding locations to include, but not limited to, training exercises and regular maintenance. Fielding locations for the AMPV include:

- Fort Riley, Kansas
- Fort Bliss, Texas
- Fort Carson, Colorado
- Fort Hood, Texas
- Fort Benning, Georgia
- Fort Stewart, Georgia
- Camp Ripley, Minnesota
- Yakima Training Center, Washington
- Camp Shelby, Mississippi
- Ft. Indiantown Gap, Pennsylvania
- Gowen Field, Idaho

PdM AMPV will have the responsibility for initial fielding of the AMPV to the receiving sites. Transportation of the AMPV will utilize a combination of highway, rail, and aircraft. The receiving units will provide fielding support such as unloading the AMPV from rail cars, transporting the AMPV to designated secure storage area(s), providing adequate de-processing facilities, and providing consumable materiel for the de-processing effort. Within this LCEA, de-processing means the necessary maintenance activities and final integration of components on the AMPV prior to the units receiving AMPVs. The de- processing activities will occur prior to the units receiving the AMPV for official use.

It has been determined that there will be zero to limited impact to existing facilities and infrastructure upon fielding the AMPV. No construction of new facilities and no structural changes to facilities are anticipated. Projected AMPV annual usage rates for both active and reserve

components total approximately 3,500 miles between the five variants, which is similar to other combat vehicles currently in the field.

4.7 Maintenance

The Army will use two-level maintenance (TLM) to support the AMPV. At the field level, Soldiers will maintain and support the AMPV with both scheduled and unscheduled maintenance activities. Scheduled field level maintenance activities consist of all preventive maintenance checks and services (PMCS), which includes visual or mechanical inspections, fluid servicing, and replacement and/or repair of parts to maintain the vehicle. Unscheduled field level maintenance includes removal and replacement or repair of Line Replaceable Units (LRUs). At the sustainment level, a mix of Government and Contractor personnel will maintain and support the AMPV. Sustainment level maintenance activities include all activities that are done off vehicle, along with rebuilding of LRUs that the field does not have the capability or equipment to handle. The AMPV program will use existing tools, Test Measurement and Diagnostic Equipment (TMDE), and Military Occupational Specialties (MOS's) currently in the ABCT to maintain the vehicle. The vehicle software will be designed with open systems architecture to allow for future growth.

During the EMD Phase, BAE Systems will provide both field and sustainment level maintenance and supply support to all test events. Field Service Representatives (FSRs) will support all test events and will provide technical assistance to maintainers and Logistics Assistance Representatives (LARs) in the ABCT and will also support data collection for PdM AMPV. During Performance, RAM, and LUT events, Soldiers and Government testers will operate and perform crew-level maintenance tasks. The Contractor will perform Field and Sustainment level Maintenance tasks. The Contractor will provide all support to include, but not limited to, training, tools, support equipment and spare parts to support the schedule test events.

During the Production and Deployment Phase, PdM AMPV will support the AMPV with a mix of organic and contractor support. This will change to 100% organic support for field level prior to First Unit Equipped (FUE). At the Sustainment Level, the AMPV will have a core depot capability established, with a mix of organic and contractor repair activities. PdM AMPV intends to leverage existing depot maintenance supply, and contract support infrastructure to minimize increases in the logistical footprint.

4.8 Demilitarization and Disposal (D & D)

Demilitarization is the act by which the military capabilities of decommissioned equipment are removed or rendered unusable. Disposal includes destroying, selling, transferring, abandoning, donating, or redistributing the demilitarized asset for civil, public or private use. PdM AMPV has developed a draft System Demilitarization and Disposal Plan (SDDP), which will be finalized prior to FRP. IAW the SDDP, the major item manager will provide disposition instructions requiring removal of hosted Mission Equipment Packages (MEPs) prior to D & D of the AMPV. Depot personnel will remove major components during demilitarization and reutilize serviceable/salvageable components. Demilitarization will require removal of Chemical Agent Resistant Coating (CARC) from all components. Based on commonality with other combat vehicles, PdM AMPV expects the following common waste products: vehicle fluids and greases, paint waste from abrasive blast, batteries, scrap metal, electronic components, track, and small

parts containing prohibited material. Government depot or civilian contractors will demilitarize and dispose of the AMPV and components at approved facilities IAW the Department of Defense (DoD) 4160.21-M-1 standard and all applicable federal, state, and local environmental, health, and safety regulations and laws.

5.0 Proposed Alternatives

5.1 Preferred Alternative

As described in Section 3.0 (Purpose and Need for Armored Multi-Purpose Vehicle Program), the AMPV will provide improved force protection, survivability, mobility, situational awareness, sustainment, and capability for future growth. It was determined that a new system was required to fulfill these needs and the AMPV program was designed to be a viable technical alternative for fully meeting the user requirements. Therefore, the preferred alternative is AMPV through the production, testing, training, fielding, operation, maintenance, and D & D of the system, as described in Section 4.0 (Description of the Proposed Action).

5.2 Alternatives Considered but Eliminated

The 2012 AMPV Analysis of Alternatives (AoA) included analysis of the following:

- Alternative 1 – Base case, the current M113 FoV
- Alternative 2 – Current and modified capital assets to include Bradley derivatives, M113 FoV upgrades, Mine Resistant Ambush Protected (MRAP) vehicles, and Stryker vehicles
- Alternative 3 – Other non-developmental items (NDIs) and modified NDIs not covered by Alternative 2
- Alternative 4 – New start development vehicle such as the Joint Light Tactical Vehicles (JLTV)
- Alternative 5 – A combination of the alternatives listed above to fill the variety of mission roles

Alternative 1 is considered the "No-Action Alternative" and will be discussed further in Section 5.3 (No- Action Alternative). Alternative 2 is the preferred alternative, as discussed in Section 5.1 (Preferred Alternative). Alternative 3 focused on analysis of various systems within the current domestic and foreign inventories. The AoA team identified candidate vehicles for the study and a small number of these vehicles were identified as having sufficient capability to host at least one AMPV MEP. The AoA analysis concluded that none of the considered alternatives met the required performance, cost, and schedule constraints of the program; therefore Alternatives 3, 4, and 5 were rejected.

5.3 No-Action Alternative

The No-Action Alternative is prescribed by CEQ regulations and serves as a benchmark against which Federal actions can be evaluated. The No-Action Alternative refers to the continuation of existing conditions without implementation of the Proposed Action or Proposed Alternatives. The No-Action Alternative would result in the Army continuing to rely on the currently fielded M113 FoV assets to complete military operations. As noted in Section 3.0 (Purpose and Need for Armored Multi-Purpose Vehicle Program), the AMPV will provide improved force protection, survivability, mobility, situational awareness, sustainment, and capability for future growth. Therefore, the AMPV AoA eliminated the No- Action Alternative as a viable option. However, as

a baseline for comparison, this LCEA includes the analysis of the No-Action Alternative in contrast to the Proposed Action.

6.0 Affected Environment (AE)

The production, testing, training, fielding and operation, maintenance, and D & D locations mentioned in Section 4.0 (Description of the Proposed Action) make up the AE for the AMPV program. For the purposes of this LCEA, environmental consequences of the proposed action and no-action alternative are analyzed at a programmatic level according to specific ERAs with regard to their potential impacts on the AEs identified above. As stated in Section 2.0 (Document Scope), the ERAs of specific interest to this analysis include:

- Air Quality
- Water Quality
- Soil Resources
- Land Use
- Socioeconomics
- Hazardous Materials and Wastes
- Non-hazardous Wastes
- Noise
- Transportation
- Biological Resources
- Cultural & Historical Resources
- Public Health & Safety

6.1 ERA Descriptions

The following ERA descriptions are used as points of consideration when conducting subsequent environmental impact analysis for each AE.

6.1.1 *Air Quality*

Air quality is described qualitatively by the presence of Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs), Ozone Depleting Chemicals (ODCs), Green House Gases (GHGs), Clean Air Act (CAA) criteria air pollutants (sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter), and other compounds foreign to the makeup of natural ambient air in a given area. Some indicators of poor air quality may include smog, smoke, or odorous emissions, while others may not be so obvious, occurring in higher altitudes with reduced ozone or contributors to acid rain.

6.1.2 *Water Quality*

Water quality refers specifically to the presence and concentration of pollutants dissolved, suspended, or floating in reservoirs (lakes, rivers, streams, water sheds, etc.), groundwater (subterranean hydrologic aquifers) and storm water (water shed from buildings, roads, parking lots, and other man-made structures).

6.1.3 *Soil Resources*

Soil resources include the soil, minerals and their respective health as they overlay natural bedrock, manmade structures, and other parent material. Specific soils exhibit specific physical, chemical, and biological characteristics that aid in delivering a healthy ecosystem.

6.1.4 *Land Use*

Land use is the human use of land which encompasses activities performed on either natural or man-made surfaces. This includes the building of structures on previously uninhabited land and performing activities on existing roadways and test ranges.

6.1.5 *Socioeconomics*

Socioeconomics refers broadly to the “use of economics in the study of society”. For the purposes of this analysis, socioeconomics will specifically focus on the social impacts and related economic changes directly affected by production, testing, training, fielding and operation, maintenance, and D & D of the AMPV. Socioeconomics may also consider how all affected environments relates to Environmental Justice (E.O. 12898, 1994) – evaluating consequences to specific ethnic and financial groups, race, and peoples of a specific geographical location. Socioeconomic metrics may include financial opportunity, life expectancy, literacy rates, employment levels, education, wealth, and overall quality of life.

6.1.6 *Hazardous Materials*

Hazardous materials shall refer to any physical, chemical, or biological agent that may cause or present harm to humans, animals, or the environment by itself or through interaction with other common agents.

6.1.7 *Hazardous Wastes*

Hazardous wastes are hazardous materials in the form of liquid, solid, semi-solid, or gas that characteristically exhibit ignitability, reactivity, corrosivity, or toxicity. Hazardous wastes are defined in the Resource Conservation and Recovery Act (RCRA). These substances pose a threat to public health and environment and their treatment, storage, and disposal are regulated by RCRA. Hazardous wastes cannot be disposed by common means and often require treatment or a phase change to render the substance inert. In some cases, special containment may be required for disposal.

6.1.8 *Non-Hazardous Wastes*

Non-hazardous wastes are those wastes not regulated as hazardous wastes by RCRA. This includes municipal solid waste and non-hazardous industrial wastes. Solid non-hazardous wastes are regulated at the Federal, State, and local levels. The Environmental Protection Agency (EPA) has established mandatory minimum requirements for environmentally acceptable waste management facilities that receive non- hazardous solid waste (40 CFR Parts 257 and 258). States must establish comparable or more stringent standards.

6.1.9 *Noise*

Noise generally refers to an unwanted sound often creating an annoyance or is capable of causing harm. Noise regulation guidelines are established at the Federal, State, province, and municipal levels of government.

6.1.10 *Transportation*

Transportation considers the increased traffic (if applicable), whether by rail, air, or road (vehicular or by foot) and evaluates its direct influence to increased congestion and degradation of transportation infrastructures.

6.1.11 *Biological Resources*

A biological resource is a substance or object required by an organism for normal growth, maintenance, and reproduction. These resources generally include food, water, and territory or other vital constituents of sustenance aiding in an organisms natural biologic processes. An eco-balanced habitat making up the Biological Resource, provides the basis for naturally occurring indigenous plant (flora) and animal (fauna) life to be sustained and flourish.

6.1.12 *Cultural and Historical Resources*

Humans relate to their environment through their culture, which may include the natural environment, the built environment, and human social institutions. Cultural resources are the remains and sites associated with human activities, to include Native American archaeological sites, historic archaeological sites, historic buildings, and elements of the natural landscape which have traditional cultural significance. This includes, but is not limited to, those resources listed in or eligible for the National Register of Historical Places.

6.1.13 *Public Health & Safety*

NEPA imposes certain responsibilities on the Federal government, including an obligation to assure a safe and healthful environment free from degradation and to achieve a wide range of beneficial uses without risk to health, safety, or undesirable consequences to the public.

7.0 Environmental Consequences

The following review assesses the environmental impacts of the proposed action on the Affected Environments related to each of the ERAs identified in Section 6.0 (Affected Environment) and considers practical mitigation to minimize the potential environmental consequences, if applicable.

7.1 Air Quality

Production

AMPV variants will be manufactured in contractor and military sites responsible for their own oversight and management of human health and environmental consequence according to Federal, State, and local

regulations. Per contractual requirements, regulatory compliance and related permitting is the responsibility of the manufacturer for all processes associated with the production of the AMPV.

Environmental aspects that exist as part of the production process of the AMPV will not vary dramatically from those typically identified, managed, and mitigated within the manufacturing process of military combat vehicles. Common environmental aspects for combat vehicles include the application of CARC and corrosion resistant plated fittings and fasteners. Processes used for these aspects include materials selection, welding, grinding, forging, cleaning, stamping, surface preparation, painting, and assembly. Each of these processes brings with them their own environmental aspects that may include airborne dusts, particulate matter, VOCs, and HAPs. Process specific products such as ozone, steam, or solvent evaporation may be present, as well as volatiles from supporting products such as adhesives, sealants, and thread-lockers. These source pollutants however, are regulated and managed according to site specific air permits and operating guidelines as well as State and Federal regulations.

In regard to CARC paint, high concentrations of isocyanates readily exist and, if not managed with process controls and personal protection equipment (PPE), can cause irritation to the skin, eyes, throat, and nose and inhibit proper respiratory function. Once cured, CARC primers and topcoats remain benign to the environment. However, when welding, grinding, sanding, or applying heat in excess of 170^0C to CARC coated surfaces, cyanates can once again become air-borne, requiring proper process controls, PPE, collection, and disposal per regulatory guidelines and laws. CARC removal during production will be infrequent and limited to small areas (less than one square foot) for occasional touch-up according to quality assurance goals. As a result, very limited quantities of air-borne cyanates will be generated outside of the highly controlled application booths used for the initial painting.

As a matter of best work practices, safety, Standard Operating Procedures (SOPs) and operational guidelines, primers, topcoat, and solvent containers will remain closed and sealed when not used to prevent fugitive air emissions. Additionally, all AMPV painting activities will occur inside paint booths that have associated air emission permits.

Testing, Training, and Fielding & Operations

Potential impacts to air quality during testing, training, fielding, and operation are related to dust generation, engine emissions, release of refrigerants and fire suppressants, and release of toxic by-products as a result of a vehicle fire.

AMPV testing, training, fielding, and operation activities will require operation of AMPV vehicles on varied drive surfaces. These surfaces could include improved (i.e. paved, gravel, sand, dirt, dirt / rock mix) primary and secondary roads, or unimproved (i.e. off-road, heavily rutted natural trails, mud, streams, etc.) drive surfaces. The operation of AMPV vehicles on improved, slightly improved, and unimproved surfaces will result in the dispersion of dust and mineral particulate matter into the air. The amount of air-borne particulate matter generated will be a function of drive

surface type and density, as well as frequency of passes, velocity, payload, and free spin of drive wheels required to satisfy the test or complete the training exercise. Individual air-borne particulate matter is expected to settle readily according to atmospheric conditions (i.e. humidity, wind, rain, etc.) at the time of the operation. Testing and training will occur on a periodic basis and for a limited duration at existing facilities. Site-specific NEPA analyses will be conducted by receiving organizations based on the unique environmental conditions at the site or specific activities

planned at the installation. Any air-borne particulate matter produced by AMPV testing or training will be comparable to that of other military vehicles performing the same operations on a given drive surface and will be temporary.

Based on 40 CFR, Section 1068.225, the AMPV is covered by a National Security Exemption (NSE) because it has permanently installed armor, making it exempt from both on-highway and non-road diesel engine EPA emission standards. Per contracts and regulations, the contractor shall ensure that NSE labeling requirements are met IAW EPA regulations. Although a non-certified engine will be used, AMPV is in compliance with EPA engine emission requirements through use of the NSE. Emissions from the AMPV will be minimized based on the limited use of the AMPV vehicles during peace-time operations.

The AMPV vehicles will be equipped with an Automatic Fire Extinguishing System (AFES). The AMPV will utilize a combination of FM-200 (HFC-227ea) and FM-200 + 10% sodium bicarbonate in the crew and engine compartment AFES system. FM-200 is a colorless and odorless halocarbon in a gaseous state, has a short atmospheric life, low global warming potential, and no ozone depleting potential. In addition, each vehicle will be equipped with hand-held fire extinguishers containing carbon dioxide (CO_2). The AFES will not be used except to combat vehicle fires. Based on the use of non-ozone depleting and low-global warming potential extinguishing agents and the limited release of the agents, the use of the AFES and fire extinguishers will not have a significant environmental impact.

In the case of a vehicle fire, burning of vehicle POLs, track, hoses, plastics, paint primers, topcoats, and fiberglass components would result in the formation of various combustion by-products typical of any commercial grade vehicle fire. These by-products could include carbon monoxide, hydrogen cyanide, aldehydes, halogenated compounds, aromatic compounds, hydrocarbons, and oxides of nitrogen, lead, sulfur, carbon, and phosphorus. A vehicle fire would be quickly extinguished, and combustion by-product concentrations would be limited – quickly dispersed by air currents to non-critical concentrations. As a result, a vehicle fire would have a negligible impact on the surrounding long term air quality.

Air conditioning units for the AMPV will contain R-134a (1,1,1,2-Tetrafluoroethane) as the refrigerant. R- 134a is non-ozone depleting, has a Global Warming Potential (GWP) of 1430 (relative to that of CO_2 with a GWP of 1), and will be handled with care by certified personnel only. AMPV TMs will contain a work package for servicing the air conditioning units. R-134a is the industry standard for air conditioning in motor vehicles. During normal operations, the refrigerant will remain in the system and will not be released to the atmosphere. Should a leak occur, the vehicle will immediately be sent for repair by a certified technician. Accidental releases are expected to be infrequent and the impact to air quality will be negligible.

GHGs related to the operation of the AMPV will include combustion products from burning of fossil fuels in the engine (CO_2 and Nitrogen Oxides), R-134a refrigerant, and HFC-227ea fire suppressant. As mentioned above, the quantity and limited use of AMPV vehicles during peace time

operations are nominal. In addition, R-134a and HFC-227ea will remain in the system and will not be released to the atmosphere during normal operations. Thus, release of GHGs from AMPV operations will not significantly contribute to climate change.

Maintenance

Potential impacts to air quality during maintenance are related to accidental release of refrigerants and fire suppressants, and the use of volatile substances contained within paints, solvents, and adhesives. As described in Section 4.7 (Maintenance), a TLM strategy will be utilized to support the AMPV. At the sustainment level, a mix of Government and Contractor personnel will maintain and support the AMPV. Contractor and Government facilities are responsible for air quality compliance at their respective facilities.

Maintenance and repair will be required during testing and training activities. Specific to air quality, these activities will include the use of small amounts of cleaning solvents and adhesives that can contain VOCs and HAPs. These materials will be used on a limited basis in conjunction with site safety and environmental management plans and will not contribute to significant air pollution.

Field level maintenance (general maintenance and upkeep functions) will be conducted at the fielding locations to include minor touch-up of painted surfaces, replacement of POLs, track, batteries, hoses, brakes, and installation of various expendable components. Some of these maintenance tasks shall require the use of solvents, adhesives, thread lockers, and anti-seize compounds which often contain volatile organic hazardous air pollutants (VOHAPs) and VOCs. Based upon consumable and expendable materials lists in current Army ground vehicle systems' TMs, the required types and amounts of materials for AMPV maintenance and repair (including criteria pollutants, VOCs, and VOHAPs) would be similar to those used during maintenance activities on other existing ground vehicle systems. Therefore, the AMPV would not require use of unique or new materials and would not represent an exceptional potential for air pollution. Further, the use of VOC / VOHAP laden sealants and adhesives would be used sparingly per current procedures and would not represent significant fugitive emissions. Appendix A provides a list of materials related to maintenance and repair activities.

Once fielded, the AMPV will require sustainment level maintenance (periodic overhaul or remanufacturing) that will include general heavy cleaning, assembly and component degreasing, removal of coatings to include CARC primer and topcoats, sanding, grinding, and removal of corrosion. Subsequently, respective rebuild operations shall be employed to include the reapplication of CARC primer and topcoats (of which the hexavalent pretreatments are prohibited), replacement of expendable parts, and replenishment of POLs.

Major overhaul and remanufacturing operations will not be conducted in the field, however these operations will be performed at qualified industrial depots facilitated for the task and permitted accordingly. Possible VOCs emitted using the specified primers and topcoats are expressed in Table 7.1.

Table 7.1: CARC Paint Systems

Military Standards	Title	VOHAPs	VOCs
MIL-DTL-53022 Type II	Corrosion Inhibiting Epoxy Primer	0	420 grams/liter (3.5 pounds/gallon)
MIL-DTL-53030 Type II	Water-based Epoxy Primer	0	340 grams/liter (2.8 pounds/gallon)
MIL-DTL-53039 Type III	Single Component, Aliphatic, Polyurethane Chemical Agent Resistant Coating	0	180 grams/liter (1.5 pounds/gallon)
MIL-DTL-64159 Type II	Water Dispersible Aliphatic Polyurethane Camouflage Coating	0	220 grams/liter (1.8 pounds/gallon)
MIL-PRF-32348 Type II	Powder Coating, Camouflage Chemical Agent Resistant Coating	0	0
MIL-PRF-22750 Type II	Coating, Epoxy, High-Solids	0	340 grams/liter (2.8 pounds/gallon)

Although these materials do contain VOCs and produce hazardous and non-hazardous wastes when sanded, grinded, or stripped, the facilities at which these processes are performed are adequately equipped with process controls to capture and mitigate fugitive emissions. Personnel are task oriented and trained specifically to conduct the tasks to minimize environmental impacts and health hazards. Each depot or industrial facility performing remanufacturing shall have their own site safety, permitting, and environmental plans for which air emissions will be controlled and regulated. Based on this information, minimal impacts to air quality are anticipated as a result of sustainment level maintenance.

As mentioned previously, air conditioning units for the AMPV will contain R-134a (1,1,1,2-tetrafluoroethane) as the refrigerant and will be handled with care by certified personnel only. As required, EPA certified refrigerant technicians using task specific equipment will evacuate and refill the R-134a into the air conditioners' condensers to minimize the possibility of any discharge of R-134a to the atmosphere. Once filled with R-134a, the air conditioning units retain the refrigerant during vehicle operation. Maintenance activities will include the periodic inspection of the air conditioning unit to ensure there are no R-134a leaks. Accidental releases are expected to be infrequent and the impact to air quality will negligible.

Similarly, the AFES will be inspected on a regular basis to ensure it is operational and that leaks do not exist. Only certified technicians will evacuate and fill the fire suppressant bottles. Accidental releases are expected to be infrequent and the impact to air quality will be negligible.

Demilitarization & Disposal (D & D)

Disposal of the AMPV will require several activities that may generate air-borne contaminants. Prior to disassembly of the vehicle hull, the CARC system will have to be removed. Removal will include abrasively removing the coatings by using blast media in self-contained blast chambers. These chambers contain filtration systems designed to remove air-borne contaminants. The spent blast media and removed coatings will be collected and placed into appropriate storage containers for proper disposal. AMPV hull and frame disassembly will be accomplished by cutting (by torch or other similar tool) into pieces. This type of cutting process generates toxic fumes through the heating of the hull's metal substrate. Safe working practices have been developed to protect workers and the environment during metal cutting. These practices range from proper ventilation of the work area to remote control of the cutting process. In addition, SOPs and regulations effectively mitigate environmental and worker health impacts.

7.2 Water Quality

Production

Fabrication and production of the AMPV will be performed at contractor and military sites subject to Federal, State, and local wastewater discharge requirements. Wastewater produced as a result of the production of the AMPV will be treated according to the production site's own National Pollutant Discharge Elimination System (NPDES) permit or be discharged to a Publically Owned Wastewater Treatment (POWT) plant. The wastewater will be appropriately treated according to governing regulations prior to being discharged to the environment, released to natural or artificial staging reservoirs, or being provided for use by the general public.

Testing, Training, and Fielding & Operations

Potential impacts on water quality during AMPV testing, training, and fielding and operations would be a result of fording operations and leaks or spills of vehicle fluids, resulting in the subsequent discharge or transport of these fluids into local bodies of water.

The majority of AMPV testing and training activities will occur in areas absent of rivers, streams, and bodies of water. Further, the function of AMPV testing will not present significant aspects that can permanently harm aquatic ecosystems. However, as part of the AMPV operational requirements, the vehicle will be capable of traversing bodies of surface water. The AMPV system will be capable of fording.

Test sites have implemented hardened surfaces at the water fording areas of the test range to include heavy coarse aggregate or concrete. These hardened surfaces will mitigate the creation of deep ruts and sediment dispersion. Any fording done as a part of training exercises should be coordinated with the local environmental office at the installation to ensure that no restrictions apply. Any minor disruptions that do occur will be temporary as the minor rutting and suspended solids will settle naturally aided by time, varying water levels, and flowing water. Exhaust

emissions should remain above the water column and not present a water quality aspect. When crossing streams, the operation of the AMPV will comply with the installations' Integrated Training Area Management (ITAM) program and Range and Training Land Program (RTLP) as part of the Sustainable Range Program with their primary objectives requiring:

- The integration of environmental planning procedures into all operations
- The protection of natural and cultural resources
- The compliance with all existing statutory regulations
- The prevention of future pollution and the reduction of hazardous waste and toxic releases

Aside from testing and training the operational functions and vehicle performance when fording waterways, the majority of AMPV operation will be limited to roadways, off-road trails, and controlled ranges. These test and training exercises will be consistent with those typical of existing Army tracked, combat vehicles and will not present additional out-of-ordinary, exceptional hazards or risks to local bodies of surface water, wetlands, or floodplains.

When used within its intended purpose, AMPV's contact with rivers, streams, and waterways will be limited, significantly reducing the quantity of spilled or leaked vehicle fluids subject to contact with natural and man-made water resources. As with most vehicles, the potential for spills due to unintentional accidents or catastrophic failure is possible when engaged in testing and training exercises, however this is an unlikely scenario. In this unlikely event, vehicle fluids could be released into the environment. The AMPV is considered to have a sealed hull that will contain fluid leaks. Because of this, there is a possibility of the vehicle collecting a mixture of fluids, which can be drained. However, testing, training, and operations will take place at existing facilities that have Spill Prevention and Countermeasures Plans (SPCCP) and pre- planned protocols to immediately respond, contain, remediate, and prevent ground water contamination. Frequent PMCS will be performed on the AMPV to ensure those design features and related components remain in good working order and within original equipment manufacturer (OEM) specifications. Should a leak or spill occur, operators are trained to immediately employ the proper containment and collection of the POLs according to the Installation Spill Containment Plan (ISCP) and the SPCCP.

Once fielded, storage of the AMPV vehicles will be within motor pools or in areas that typically have concrete or bituminous surfaces. Many of these parking areas incorporate perimeter berms to prevent the migration of leaked or spilled POLs from entering storm drains. Inspections will be completed at regular intervals to identify any leaks. Also, as a matter of protocol, select containers and catch basins will be employed under the vehicle to catch and retain any fluids that may leak and drip while parked. Environmental impacts to water quality related to leaks and spills are expected to be minimal based on the limited annual operations of the vehicle and the existing plans and procedures in place at the installations for management and clean-up of spills.

Maintenance

Potential impacts to water quality during maintenance activities are related to spilled (new or used) vehicle fluids and wastewater management from chemical processes during sustainment level maintenance.

Occasional maintenance and repairs on AMPV vehicles will occur during testing, training, and fielding. These activities involve periodic removal or addition of hydraulic fluid, engine coolant, fuel, and oil, and are conducted in specifically designed maintenance bays at the installations. These maintenance areas have hardened or concrete floors equipped with oil/water separators in the floor drains and plumbing. These infrastructure features enable containment, collection, and proper disposal of vehicle fluids preventing the migration of spent engine fluids to surrounding water resources.

Field level and sustainment level maintenance will follow procedures specified in TMs, which includes complying with local environmental laws, regulations, and policies including SPCCPs and ISCPs. These plans are designed to minimize, if not eliminate, the migration of vehicle fluids into the installation sanitary sewer lines and surrounding bodies of water. For example, work areas have spill containment kits, and if a spill occurs during fluid draining, the FSRs or maintainers would utilize the kits to minimize the spill and prevent fluid migration into installation sewers or nearby bodies of water. By following the TM procedures, other installation requirements, and utilizing the appropriate equipment, the migration of vehicle fluids to local waterways or groundwater would be minimized, if not eliminated.

As an additional mitigation, using vehicle specific TMs, protocols will be performed to identify potential fluid leaks and the necessary preventive maintenance to prevent the leaks from occurring. Maintenance will be performed in controlled maintenance areas and all POLs, hazardous, and non-hazardous waste will be contained, collected, and disposed of according Federal, State, and local regulations.

Periodically, sustainment level maintenance will be required to be performed at an industrial depot. This level of maintenance constitutes a rebuild or remanufacture and will include similar processes to those required during the production or fabrication of the vehicle, in addition to preparatory processes. These processes may include a vehicle tear-down and fluid purge, general cleaning, precision cleaning and stripping, non-destructive inspection of reusable components, and various organic and inorganic refinishing processes to make ready for re-assembly. From tear-down to decontamination, process treatment, and re- assembly, all sustainment maintenance will be performed at facilities specifically designated, permitted, and facilitated to conduct the required operations according to protocols that specifically limit environmental impacts. These mitigative protocols account for process wastewater, treatment, and recycle, as well as weather related run-off into storm drains and sewers which prevent contamination of natural water resources and potable water supplies. By complying with wastewater regulations, other installation requirements, and utilizing the appropriate equipment, the migration of vehicle fluids to local waterways or groundwater will be minimized, if not eliminated.

Demilitarization & Disposal (D & D)

Potential impacts to water quality during D & D operations could result from improper disposal of vehicle fluids, vehicle fluids spills, outdoor storage of vehicle components that may contain grease or leaking fluids, and improper handling or storage of paint waste following paint removal. Similar to scheduled maintenance, D & D activities will be conducted within existing facilities designed for D & D operations.

During D & D operations, any vehicle fluids will be removed and properly stored until appropriate disposal methodology is identified in accordance with environmental laws and regulations. Recycling is the preferred method of disposal for vehicle fluids. If the D & D facility determines

the need for disposal of fluids rather than recycling, the wastes will be handled IAW with applicable environmental regulations.

Outdoor storage of vehicles or parts awaiting disposal may occur which could result in pollutants entering bodies of water including dripping fluids, washing away of greases during rainfall, or washing away of paint waste dust if the vehicle is stored outdoors after paint removal. However, D & D facilities are equipped with proper containment controls, have existing ISCP's and SPCCPs, and are responsible for compliance with applicable regulations. Many of these storage areas incorporate perimeter berms to prevent the migration of leaked or spilled POLs from entering storm drains. Also, as a matter of protocol, select

containers or catch basins will be employed under the vehicle to catch and retain any fluids that may leak and drip while parked.

By following the standard D & D procedures, other installation requirements, and utilizing the appropriate equipment, the migration of vehicle fluids and other wastes to local waterways or groundwater will minimized, if not eliminated.

7.3 Soil Resources

Production

Fabrication and production of the AMPV will be performed at existing contractor and military sites that do not exist solely for the acquisition of vehicles through the AMPV program. Instead, the potential manufacturing sites are pre-existing for the manufacture of varied goods and equipment and would continue to produce goods outside of the AMPV if the AMPV contract did not exist or was not awarded. Therefore, soil erosion, compaction, or altered chemical and biological characteristics due to the manufacture of the AMPV will not occur in excess of that which already exists. Simply, the sites will continue to conduct the manufacture of goods of similar magnitude whether or not the AMPV program remains. Thus, at the point of manufacture, soil resources are neither harmed nor improved.

Testing, Training, and Fielding & Operations

Potential impacts to soil resources during testing, training, fielding, and operations of the AMPV include erosion, soil compaction, and contamination of soil.

AMPV vehicles will operate on existing test ranges and training maneuver areas that have already been utilized for testing and individual, unit, and crew training of other tracked combat vehicles (i.e., Bradley Fighting Vehicle Systems FoV, Abrams Tank Systems, and M113 FoV). Since the actual test and training areas have already been disturbed by prior activities, any disturbance to soils surrounding the roadways will have already occurred, and as a result, installation personnel will have already constructed and implemented erosion control plans. Testing, training, and operation of the AMPV vehicles and subsystems will be performed IAW existing erosion control plans.

Outside of testing and training, operation of the AMPV during fielded use will primarily occur on paved or improved drive surfaces intended for vehicular travel. Off-road use may occasionally occur, however repetitive off-road use will likely be restricted to designated ranges that are maintained and managed according to specific environmental plans.

Any soil erosion and compaction that does occur due to AMPV operations will be addressed by site-specific NEPA documentation, if necessary. Each site will have unique soil characteristics, making a programmatic evaluation of soil erosion and compaction difficult to accurately assess. However, installation personnel are commissioned to conduct the necessary evaluations and prepare related NEPA assessments to include soil resources. Ground pressure data has been estimated for the AMPV and can be used by site personnel to determine the extent of potential soil compaction or

erosion caused by the proposed action. This will further assist in determining a means for implementing useful mitigative actions. AMPV ground pressure data is similar to the currently fielded Bradley Fighting Vehicle System and should not cause additional soil erosion or compaction.

As discussed in the previous water quality section, the potential for spills due to unintentional accidents or catastrophic failure is possible but unlikely when engaged in testing and training exercises. In this unlikely event, vehicle fluids could be released into the environment. The AMPV is considered to have a sealed hull that will contain fluid leaks. Because of this, there is a possibility of the vehicle collecting a mixture of fluids, which can be drained. However, testing, training, and operations will take place at existing facilities that have SPCCPs and pre-planned protocols to immediately respond, contain, remediate, and prevent ground water contamination. Frequent PMCS will be performed on the AMPV to ensure those design features and related components remain in good working order and within OEM specifications. Should a leak or spill occur, operators are trained to immediately employ the proper containment and collection of the POLs according to the ISCP and the SPCCP.

In regards to the potential release of POLs, hazardous materials, and non-hazardous materials and accelerated soil erosion and compaction, deployment of the AMPV is highly unlikely to alter or degrade soil, mineral content and their respective health as they overlay natural bedrock, manmade structures and other parent material. Fielding of the AMPV is not expected to exhibit any exceptional soil impact beyond that observed from the operation and deployment of current combat vehicles.

Maintenance

Potential impacts to soil resources during maintenance activities are related to spilled or leaked vehicle fluids onto the ground.

Occasional maintenance and repairs will occur during testing, training, and fielding of the AMPV. These activities will include the replacement of vehicle POLs, to include hydraulic fluid, engine coolant, fuel, and oils. In addition, adhesives, sealers, thread locking compounds, and solvents will be used during maintenance activities. These repair and maintenance activities will be performed according to TM protocol written to mitigate spillage and release of hazardous materials into surrounding soils. These repairs and maintenance activities will be performed in motor pools and designated maintenance areas that have paved or hardened surfaces. Where applicable, containment berms and collection basins will be utilized, together preventing leaks and spills from migrating into surrounding soils.

Maintenance and repair of AMPV vehicles following fielding will be required and shall be conducted in designated maintenance areas designed to minimize environmental impacts to soil and other resource areas. Significant environmental release of foreign materials – either hazardous or non-hazardous – is not expected and should not present a threat to physical, chemical, and biological characteristics of soil resources.

Scheduled sustainment level maintenance will be performed on the AMPV to ensure specified working order of the vehicle and to prolong the useful service life of the asset. Sustainment level maintenance will be performed at specially equipped pre-existing depots that currently support sustainment operations of other materiel. In addition to the required processes for remanufacture of

the AMPV, the pre-existing depots are equipped with the necessary infrastructure to prevent the release of vehicle fluids and contaminates to soil resources during sustainment operations. Also, given that overhaul and remanufacture will be conducted at pre-existing depots, no additional soil disruption is likely to occur based on the existence of the AMPV alone. Whatever environmental aspect is presented by performing sustainment level maintenance on the AMPV, the responsible depots have environmental management, mitigative, countermeasure, and response plans in place with extensive experience in employing those plans when

necessary. Therefore, disruption to soil resources as result of sustainment level maintenance performed on the AMPV is unlikely.

Outdoor storage of vehicles or parts awaiting maintenance may occur, which could result in soil contamination from the following: dripping fluids, washing away of greases during rainfall, or washing away of paint waste dust if the vehicle is stored outdoors after paint removal. However, depot facilities are equipped with proper containment controls, have existing ISCP's and SPCCPs, and are responsible for compliance with applicable regulations. AMPV storage prior to maintenance will likely be done on hardened surfaces as to not alter soil density and provide an impervious surface for fluids that may occasionally leak or drip from the vehicle. Spill berms will be used to prevent any leaking fluids from migrating to storm drains. Spill pans will also be employed while the vehicle is staged to further mitigate the leaching of leaked vehicle fluids into concrete or paved surfaces. These procedures will mitigate the possibility of releasing vehicle fluids outside of the controlled staging area should a leak exist.

Demilitarization & Disposal (D & D)

Potential impacts to soil resources during AMPV D & D operations could result from improper disposal of vehicle fluids, vehicle fluids spills, outdoor storage of vehicle components that may contain grease or leaking fluids, and improper handling or storage of paint waste following paint removal. Similar to scheduled maintenance, D & D activities will be conducted within existing facilities designed for D & D operations.

D & D facilities are equipped with proper containment controls, have existing ISCP's and SPCCPs, and are responsible for compliance with applicable regulations. D & D will typically be performed in smaller batches instead of the entire fleet of vehicles, thus making permanent soil impacts improbable if a small release were to occur. As a matter of protocol, drip pans will be employed to mitigate release of fluids to soil resources for all staged vehicles awaiting D & D. If a spill were to occur, existing clean up procedures will be followed. Any fluids collected in the drip pans will be recycled or disposed of IAW Federal, State, and local regulations.

By following the standard D & D procedures, other installation requirements, and utilizing the appropriate equipment, soil contamination will be minimized and a significant impact is not anticipated.

7.4 Land Use

Production

Production of the AMPV vehicles will take place at existing commercial and military facilities as discussed in Section 4.3 (Production). The acquisition and production of the AMPV is not expected to require the construction of new facilities that will adversely alter the natural environment or surrounding land. Consequently, it is not anticipated that the production of the

AMPV will burden the manufacturing site, adjoining property, or host community with environmental impacts beyond those already planned or permitted by the manufacturer.

Testing, Training, Fielding & Operations, and Maintenance

Testing, training, fielding and operations, and maintenance of AMPV will occur on existing test courses, ranges, and installations. Construction of new test and training courses, installations, or facilities are not planned. Impacts on land are expected to be similar to that observed using other tracked, combat systems proven to exhibit nominal impacts to the environment.

Environmental management procedures for existing testing and training courses have already been established for previous generation vehicles and will translate easily for the testing and training of the AMPV with proven effectiveness. Therefore, no additional land development, rearrangement, or terrain modification is expected to be needed in order to meet the AMPV program requirements.

Fielding and maintenance will occur at installations that already have, maintain, and manage vehicles with similar requirements. Thus, the AMPV will utilize existing infrastructures for storage, maintenance, cleaning, and transport of which are subject to existing environmental management plans. New land development for the storage, maintenance, operation or overhaul of the AMPV is not anticipated.

Demilitarization & Disposal (D & D)

AMPV D & D activities will not require new, additional, or unique structures or equipment. D & D of the AMPV will be performed at existing depots or civilian operated contracted facilities and will not require the development, rearrangement, or modification of land; nor will D & D activities impact or interact with neighboring lands. Instead, D & D will be performed within the confines of existing infrastructures subject to existing environmental management, regulations, and permitting specific to those functions required for D & D.

7.5 Socioeconomics

No negative social or economic impacts are expected for the Government due to the acquisition and production of the AMPV. To the contrary, acquisition of the AMPV should assist in sustaining employment for the manufacturer, stimulate the purchase of materials from suppliers, provide financial gain to transporters, and assist in maintaining a vital tax base for the local community. Beyond the sustainment of employment and contributing to the vitality of existing businesses, there are no expected consequences that may uniquely impact specific ethnic groups or peoples of low income. Additionally, there are no known or expected hazards associated with the production of the AMPV that will impact the life expectancy of workers or citizens dwelling within the neighboring communities.

While activities will be performed at various existing locations, impacts to socioeconomic metrics are not anticipated as levels of activity resulting from AMPV activities are nominal when compared to the overall activity of each respective site. Manpower to conduct AMPV activities will be provided by existing government employees, contractors, and military personnel stationed

at the activity sites. Therefore, no significant hiring initiatives will be required to support the AMPV program.

All D & D functions will be performed at existing sites and, while depots or contractors may benefit temporarily from D & D revenue streams, there should be no negative consequence to specific ethnic groups, race, or overall quality of life.

There is no E.O. 12898 “Environmental Justice” concerns associated at the programmatic analysis level of the AMPV since it is not anticipated that the proposed action will result in any disproportionate high and adverse human health and environmental effects on children, minority, or low income populations. Although no significant impacts are anticipated, personnel at installations which receive the AMPV will determine if additional site specific NEPA documentation is required to address potential and real socioeconomic impacts.

7.6 Hazardous Materials & Wastes

Production, Testing, Training, Fielding & Operations, and Maintenance

Hazardous materials required for vehicle production, operation, and maintenance of the AMPV will include items such as paints, adhesives, solvents, solder, sealants, batteries, refrigerants, fire suppressants, coolants, various POLs, and metal plating materials. The amount and type of hazardous materials used during AMPV activities are consistent with the current type and volume of hazardous materials used on other ground vehicle systems. The use of these hazardous materials during testing, training, and fielding activities will also result in the generation of hazardous wastes.

The AMPV contract included requirements to eliminate or minimize the use of hazardous materials required for production, operation, and sustainment of the AMPV. All remaining hazardous materials have been identified and tracked in a Hazardous Materials Management Report (HMMR). A list of known AMPV hazardous materials are included in Appendix A. A brief discussion of the AMPV hazardous materials and potential impacts is included below.

The vehicle fluids required in the AMPV are listed in Table 4.2-2 in Section 4.2 (AMPV System Description). These fluids will sometimes require draining, filling, and disposal. This will occur at regular intervals throughout the life of the vehicle. Testing, training, fielding, and maintenance activities will be conducted in a maintenance bay or garage where facilities exist for proper handling and storage of POLs. Unless Federal, State, or local laws state otherwise, used vehicle POLs, not contaminated by heavy metals or other contaminants, are usually considered non-hazardous wastes and are either recycled or disposed of as a non-regulated waste through the installation hazardous waste management facility. Military installations also have SPCCPs, ISCPs, and other SOPs that address POL handling, storage, disposal, and clean-up in case of an accidental spill. These activities will also be periodically taught during training activities.

In addition to hazardous fluids, the AMPV will utilize multiple maintenance free, Absorbed Glass Mat (AGM), sealed lead acid batteries. The sealed batteries prevent acid leaks and spillage, even when the battery is tilted at extreme angles or positions. AMPV TMs will include instructions for proper handling and disposal of the batteries. Used or expired batteries will be stored and disposed of IAW site safety and environmental procedures.

As mentioned previously, R-134a (1,1,1,2-Tetrafluoroethane) refrigerant will be used in the AMPV air conditioning system. The AFES will utilize both pure FM-200 and a FM-200 + 10%

sodium bicarbonate powder as extinguishing agents. These materials will be handled only by EPA certified technicians. See Section 7.1 (Air Quality) for additional discussion. Any refrigerant or fire suppressant evacuated from the system will be reclaimed for reuse or disposed of IAW EPA regulations.

Manufacture of the AMPV will require the use of CARC paint processes requiring surface pretreatments and primers. Application and removal of CARC may be required to support testing, training, and fielding activities. When unit personnel use CARC for touch ups and spot painting, they are required to use only small quantities. Full re-painting of the AMPV would take place during sustainment level maintenance and would be performed in a permitted paint booth. For any paint system, substrate cleaning is required and may be conducted using solvents or aqueous based detergents that may contain some VOC content. Process controls and operational protocols limit fugitive emissions outside of the process boundary for cleaning and coating application processes, promoting the controlled collection, containment, treatment, and proper disposal of the hazardous material. Also, chromate-free pretreatment systems are preferred and directed for use. Painting operations generate spent thinners, stripping solvents, waste paint, fiberglass paint filters, and used paint thinner. Any paint waste stream will be treated as hazardous wastes in accordance with Federal, State, and local laws and regulations.

Cured primers and topcoats are benign to the environment. However, stripping processes such as grinding, sanding, scraping, media blasting, or solvent removal generate a hazardous waste stream. If primer and topcoat removal is required, maintenance personnel will collect, handle, store, and dispose of the removed coating materials IAW applicable plans, procedures, and regulations.

Small amounts of toxic metals such as hexavalent chromium, cadmium, and lead will be present on AMPV components. Cadmium and hexavalent chromium are used for plating the military-type electrical connectors and fasteners used on AMPV. Lead is used in solder, some engine components, and in the batteries. During operation, these materials pose a negligible risk to personnel and the environment. The risks associated with using these materials exist primarily in the application process of the hazardous element or in the removal and disposal of the material. Maintenance processes such as grinding, sanding, and media blasting could release toxic metals as respirable particles. These activities will be performed in areas with proper ventilation controls by personnel following applicable plans and procedures while wearing the required protection equipment. Wastes generated from processes with heavy or toxic metals will be collected, handled, stored, and disposed of IAW applicable Federal, State, and local laws and regulations. Most plated metal components will be recycled as scrap metal.

Various other hazardous materials will be associated with the AMPV production and maintenance which are typical of tracked, combat vehicles. Various solvents, aqueous cleaners, adhesives, sealants, chemical strippers, and anti-seize compounds will be required for AMPV maintenance. Production may include acid baths used for the application of inorganic coatings, aqueous rinse, and solvent cleaners; and a myriad of adhesives and sealants. The use of some of these materials will result in hazardous wastes which will be disposed of IAW with applicable regulations.

Although hazardous materials will be used throughout the phases of the AMPV program, they will be managed according to Federal, State, and local environmental regulations. Compliance with these regulations will be the responsibility of the facility using the hazardous materials or

generating the hazardous waste (manufacturer, testing site, training site, fielding site, or depot). These materials will be comparatively similar to those required for other military vehicles and present nothing unique in the way of stocking items, handling, storage, and disposal. Therefore, existing protocols for proper transport, handling, storage, application, and disposal of the hazardous materials and associated hazardous wastes will be used. Based upon the frequency of maintenance and repair conducted for currently fielded vehicles, the

quantity of repairs should remain limited to several vehicles and trailers per month. As a result, quantities of hazardous waste will be limited in volume. As a matter of protocol, hazardous materials will be stored in areas with hardened floors equipped with perimeter spill-retention berms. Should a spill or release of hazardous substance occur, personnel would respond according to the sites' existing ISCP and SPCCP protocols.

Overall, the hazardous materials and wastes related to the AMPV will not present extraordinary use, storage, or quantities and will not require special materials or infrastructures as compared to current tracked, combat vehicles within the Army inventory. Therefore, assimilation of the AMPV into field installations will be seamless and not generate new or additional waste streams of materials hazardous to human health or the environment.

Demilitarization & Disposal (D & D)

Some hazardous waste will also be generated during D & D of the AMPV. The main source of the hazardous waste will be the removal of hazardous coatings and the media used for removal. Vehicle fluids will also be drained, electronics removed, and batteries removed. All waste will be managed and disposed of according to Federal, State, and local laws and regulations. If the vehicle undergoes D & D at a military or Government-owned, contractor-operated (GOCO) facility, Defense Logistics Agency (DLA) Disposition Services is responsible for disposing of all of the items. If the vehicle is demilitarized at a contractor-owned, contractor-operated (COCO) facility, the facility's management is responsible for the disposal of the materials. Alternatives available for disposal include recycling, reuse, reprocessing, and discard. Recycling is the preferred method of disposal.

Before disposal, all items will be categorized as either hazardous or non-hazardous waste by Federal, State, and local standards and regulations. All recyclable materials will be processed at the appropriate facilities. Furthermore, any facilities that receive recyclable materials, non-hazardous waste, or hazardous waste must meet all Federal, State, and local laws and regulation for the type of materials or wastes that their facility accepts.

7.7 Non-Hazardous Wastes

Production

Production of the AMPV requires an extensive Bill of Materials (BOM) that will be made up the raw components, bonding agents, spent and disposable tooling, raw material packaging, etc. Some of the scrap or left over materials from manufacture are likely to be recycled for use on other fabrication projects, while some may be recycled at the local municipal recycling plant. The respective volumes of non-hazardous wastes, however, are not anticipated to significantly increase or overwhelm waste streams to local landfills or recycling facilities. All wastes shall be handled according to the manufacturing facilities' waste disposal plan. Disposal will be in accordance with applicable State and local requirements.

Testing, Training, Fielding & Operations, and Maintenance

Non-hazardous wastes associated with the AMPV will mainly consist of track, POLs, packaging, wrappings, and pallets. If vehicle fluids are not contaminated with heavy metals, they are considered non- hazardous and will be recycled when possible or disposed of according to site requirements subject to

Federal, State, and local law. Additionally, field maintenance and repair will be required, to include reattaching loose components, replenishing vehicle fluids, replacing components, and other related activities. These maintenance activities will generate a small quantity of non-hazardous waste, which would primarily consist of packaging material, including cardboard boxes, pallets, plastic containers, and wrappings. Sustainment level maintenance will result in similar non-hazardous wastes to those from production. Unique or new non-hazardous waste streams will not be generated by maintenance activities. The volume of non-hazardous waste generated by AMPV maintenance and repair is not anticipated to exceed other similar ground vehicle systems' and will be easily managed by existing non-hazardous waste protocols at each respective site. When applicable, parts and wastes will be recycled in lieu of disposal in accordance with existing site procedures and guidelines.

Demilitarization & Disposal (D & D)

During the demilitarization process, personnel will strip AMPV systems of all easily removable, unclassified components that will be retained, disposed of, or demilitarized. Personnel will then demilitarize the remaining vehicle structure and components. Fluids will be drained and, if not contaminated with heavy metals, will be recycled when possible or disposed of in accordance with Federal, State, and local laws. Major subsystems such as the power packs, fuel tanks, and batteries will be removed; and every effort will be made to reutilize serviceable components. The vehicles' structure and attached fixtures will be sold as scrap metal, as they are considered a "high grade" scrap material that is readily marketable for reuse or recycling as a common, environmentally-preferable process. Any remaining non-hazardous wastes associated with D & D will be disposed of IAW Federal, State, and local regulatory laws.

7.8 Noise

Fabrication and production activities associated with the AMPV shall not present noise beyond that expected for fabricating similar combat vehicles. Cutting, welding, forging, metal stamping, fastening, sanding, and painting are routine functions for the manufacturing sites and would occur whether or not the AMPV was being fabricated. Similar noise will result from maintenance and D & D activities which will be performed at existing industrial areas. Noise levels above the 85 decibel (dB) time weighted average are to be expected and will be mitigated with the proper PPE according to site safety and Occupational Safety and Health Administration (OSHA) regulations. Nuisance noise beyond site zoning laws and permitting is not expected and should not have any impact on neighboring properties.

Operation of the AMPV during testing, training, and fielding activities will generate noise from the engines and weapon firing that may adversely affect nearby wildlife and may potentially cause human health risks. Weapons used on the AMPV system are all common weapons found in the Army system. PdM AMPV does not plan to collect noise data from these weapons, with the exception of the MC variant, which will go through noise testing. AMPV engine noise data will also be collected. According to the AMPV performance specification, the AMPV shall conform to the requirements of MIL-STD-1474D for steady- state and impulse noise in personnel occupied

areas. Based on noise data collected from similar systems, hearing protection will likely be required for operators and maintainers working both inside and outside of the vehicle.

The Noise Control Act of 1972 established that Federal agencies should comply with Federal, State, interstate, and local requirements requiring control and abatement of environmental noise to the same extent

as private entities. Per Army Regulation (AR) 200-1, testing, training, and fielding facilities are required to comply with the Army's Environmental Noise Management Program (ENMP). The goals of the Army's ENMP are to: (1) control environmental noise to protect the health and welfare of people, on- and off- post
/ Civil Works Facilities (CWF), impacted by all Army-produced noise, including on- and off-post / CWF noise sources; and (2) reduce community annoyance from environmental noise to the extent feasible, consistent with Army testing, training, and fielding activities.

During testing, training, or fielding and operations, the AMPV will not exhibit sufficient sound levels to create an annoyance, harm, or noise pollution to environments, ecosystems, and communities beyond that of the testing, training, or fielding site. The AMPV will be operated at existing testing, training, and fielding sites which already house military ground systems and perform supporting operation and maintenance activities. These facilities are located in developed areas away from residential neighborhoods to reduce community annoyance and protect environmental welfare. In addition, AMPV noise generation will be similar to existing systems which have not shown a significant impact to personnel or the environment when the system is used and maintained in accordance with TMs and the facility ENMP. Therefore, impacts related to AMPV noise generating activities are expected to be insignificant.

7.9 Transportation

Production

As stated in Section 4.3 (Production), AMPV vehicle production will be done at two BAE facilities (York, Pennsylvania and Aiken, South Carolina) and at RRAD near Texarkana, Texas.

These facilities are equipped with existing infrastructure facilitated and operated with full-time employees supporting the production of the AMPV among other products. Significant hiring of employees, either temporary or permanent, is not anticipated. Since other products are currently being produced, a steady flow of raw materials to the manufacturing site is considered normal and the production of the AMPV will not represent a significant flux in increased traffic – either by raw material deliveries, foot-traffic, or by employee daily commutes. Therefore, it is not expected that the production of the AMPV will contribute to increased vehicular congestion on local roadways or contribute significantly to the degradation of local transportation infrastructures.

Testing & Training

Delivery of the AMPV to testing and training sites will be facilitated by a combination of road (via Heavy Equipment Transporter (HET)) and rail. Road transportation will include freeways, highways, and inner city streets. The HET will be required to maintain legal weight limits and only a small number of vehicles will be delivered for test and training activities. Testing and training exercises will be conducted primarily within the boundaries of the select testing and training sites and will not have any bearing on external transportation infrastructures. Transportation of the AMPV associated with testing and training activities will be for a limited

quantity of vehicles and for a limited duration. Impacts due to the transportation of the AMPV for testing and training are expected to be insignificant.

Fielding & Operations

The AMPV will have the capability to be transported by towing, self-propulsion, or by carrier via railways, highways, waterways, oceans, and airways by meeting the transportability requirement of MIL-STD- 1366E, MIL-STD-209K, and MIL-STD-810G. Whether by road, rail, sea, or air, the transportation of the AMPV to fielding sites shall not restrict, bottleneck, or cease the flow of Government or civilian essential traffic conduits. All Federal, State, and local transportation laws will be strictly adhered to. There is no extraordinary characteristic of the AMPV either in weight or dimensions that make it likely to contribute to excessive wear of drive surfaces. When transported by military or commercial HETs, the AMPV will be within the maximum highway permit limits established by the Federal Government, individual states, and appropriate foreign authorities. The AMPV will meet the DoD rail clearance profile and withstand the rail impact test IAW MIL-STD-810G. Impacts due to the transportation of the AMPV for fielding are expected to be insignificant.

Demilitarization & Disposal (D&D)

D & D activities are not anticipated to impact flow of traffic or degrade transport infrastructures. The volume of traffic created by the AMPV D & D per given time is nominal when compared to daily commercial, Government, and civilian volumes of traffic. D & D will be performed at existing industrial sites and will not require the significant hiring of laborers or construction of facilities. Therefore, increased local traffic is not expected. Delivery of the AMPV to D & D sites will likely be facilitated by HET or railway subject to all Federal, State, and local transportation and environmental laws.

7.10 Biological Resources

AMPV production, maintenance, and D & D activities will occur in existing facilities already being used for similar activities. All processes will be performed in such a manner to reduce the possibility of fugitive emissions to ground, air, and water. Whether hazardous or non-hazardous, all contractors and supply vendors are required to conduct production activities in a manner that minimizes the release of agents to surrounding environments. Therefore, the proposed action will neither provide nor deny sustenance for native biological organisms; nor should it alter the environment to encourage the development or settling of foreign organisms.

Testing, training, and operations will occur on existing military installations which are currently used for similar activities for other military ground systems. The sites have existing natural resource management programs. These programs will include a site-specific Natural Resources Management Plan, Integrated Training Area Management Programs, and other resource management programs as required by Service unique requirements.

Site personnel will be responsible for ensuring that AMPV operations will not embark on protected habitat areas that support endangered and threatened species. By nature of the AMPV being a mobile vehicle, any exposure of the AMPV to biological resources will be extremely temporary.

By following existing management plans and procedures, no significant impact to biological resources is anticipated due to AMPV operations. However, prior to operations, site personnel will be responsible for assessment of site- specific biological resources and determining if additional NEPA documentation is required to assess site- specific impacts.

D & D activities for the AMPV will be conducted at existing industrial sites with the expectation that the dismantling, collecting, and disposal of the AMPV are functions within the normal operational parameters and mission of the site. Therefore, suitable infrastructures such as buildings, floors, cranes, collection bins, storm drains and sewer systems, perimeter berms, recycle, and trash receptors shall be in place to mitigate excessive or damaging wear to soil, minerals, and associated biological characteristics to the natural ecosystem.

7.11 Cultural & Historical Resources

Production

As stated in Section 4.3 (Production), AMPV vehicle production will be done at two BAE facilities (York, Pennsylvania and Aiken, South Carolina) and at RRAD near Texarkana, Texas.

The National Register of Historic Places is the official list of districts, sites, buildings, structures, and objects deemed worthy to preserve according to its history or cultural significance. Each of the aforementioned cities have evolved from attributes and historical influences provided by Native Americans, the Civil War, the Industrial Revolution, specific natural resources, and skilled labor that were instrumental to their creation.

At all four locations, the AMPV will be produced in existing industrial facilities that have been approved and permitted by State and local governments to conduct industrial activities. The production of the AMPV is not expected to require the construction of new supporting infrastructure. No impact on cultural resources is expected as a result of AMPV production.

Testing, Training, Fielding & Operations, and Maintenance

Testing, training, operations, and maintenance will take place at existing military installations or facilities. AMPV operators and maintainers will follow existing site cultural resource management programs. These mandated programs will include site specific Integrated Cultural Resources Management Plans (ICRMP) as required by Service unique requirements. The ICRMP is an internal U.S. compliance and management plan that ensures known and potential cultural resources are protected during site activities. According to ICRMP, site cultural resource managers will evaluate the operation and maintenance of the AMPV and their impact on cultural resources prior to activities commencing. AMPV testing, training, operations, and maintenance will not require new construction of buildings, test tracks, or maintenance hubs. Therefore, disruption or impact to Native American or historical archaeological sites, historic buildings, or elements of culturally significant landscapes is not likely.

By following existing management plans and procedures, no significant impact to cultural resources is anticipated due to AMPV operations or maintenance. However, prior to operations, site personnel will be responsible for assessment of site-specific cultural resources and determining if additional NEPA documentation is required to assess site-specific impacts.

Demilitarization & Disposal (D & D)

AMPV D & D activities will be performed at established government or industrial facilities properly zoned to conduct the required demolition. Therefore, these sites have complied with Federal, State, and local

zoning laws and do not interact, damage, degrade, or destroy Native American archaeological sites, historic sites or buildings, buildings listed in the National Register of Historic Places, or landscapes of cultural significance.

7.12 Public Health & Safety

The AMPV program follows MIL-STD-882E, “DoD Standard Practice for System Safety”. MIL-STD- 882E is a systems engineering process to identify ESOH hazards and manage associated risks. Risk management includes the implementation of mitigative responses to ESOH impacts for the operation of the AMPV and for the immediate environment and general public for which the AMPV inhabits.

Inherent safety hazards always exist when conducting system tests and training operators on the use and maintenance of new equipment. These risks are often mitigated by abiding by system specific safety guidelines and utilizing the specified tools, equipment, and PPE designated for the particular task by system TMs and site safety protocols. The AMPV will be fielded at existing locations currently fielding similar systems such as the Bradley Fighting Vehicle and the Abrams Tank System. Thus, the infrastructures for maintenance, sustainment, and ESOH activities already exist and will easily accommodate the similar requirements of the AMPV.

In regards to Public Health & Safety, testing, training, maintenance, and operations will be performed at existing locations that frequently conduct similar activities for varied systems beyond the AMPV. These sites have been zoned and permitted by local authorities to conduct such operations and do so in separation from residential and general commerce communities. Therefore, most AMPV activities will be conducted in controlled areas isolated from the general public and will not subject the general public to environmental, health or safety risks. However, given the AMPV mission requirements, the AMPV will be deployed worldwide – in missions of peace and conflict. The existence of the AMPV and its operation are relatively benign to the safety and well-being of the general populace and its surroundings. The AMPV does not require materials or substances of extraordinary hazard to operate nor does it emit engine exhausts, electromagnetic radiation, radioactive emissions, heat, sound, or other hazards beyond that expected from commercial grade utility trucks approved for use within public environments daily.

All aspects of D & D functions that potentially impact human health and environment will be contained, managed, and mitigated according to applicable Federal, State, and local law within the site performing the work. To the general public, there is no exceptional characteristic of the AMPV that would present a potential or likely hazard during D & D; nor is there any exceptional quality or contamination – organic, chemical or biological – that would present a threat to the D & D site, bordering properties or surrounding communities.

8.0 No-Action Alternative

Under the No-Action alternative, AMPV production, testing, training, fielding and operations, maintenance, and disposal would not occur. The U.S. Army would continue to use, train with, and maintain existing weapon systems.

The manufacturing sites would remain without the production of the AMPV, conducting similar operations for the fabrication of other goods. Existing test sites would continue to host other tests for ground vehicle

systems with similar environmental aspects. The results of these tests would exhibit similar environmental impacts as those tests conducted for the AMPV. Also, without the AMPV, the current stock of vehicles would likely require design enhancements that would need to be tested for compliance of updated operational capability requirements.

Under the No-Action Alternative, AMPV fielding would not occur. Instead, those installations that would have received the AMPV would continue to host and utilize other military vehicles for the expressed purposes for which the AMPV was designed. Based upon historical observations, the operation of current vehicle systems would have similar environmental impacts as all variants and subsystems of the AMPV and would be less suited for the mission, current military tactics, and operational needs. Therefore, a greater number of vehicles of current stock may be required to complete the task or the use of current stock may limit mission capability and occupant survivability.

Additionally, the No-Action Alternative would eliminate the need for D & D of all the AMPV. However, currently fielded systems dedicated to take on the AMPV operational role would also require D & D. The impacts associated with the D & D of those vehicular systems would be similar to those associated with the AMPV.

9.0 Conclusion

At a programmatic level, environmental risks associated with the AMPV are expected to be minimal over the system lifecycle. Mitigation measures have been identified as part of this analysis. In addition, careful adherence to Federal, State, military, and local environmental regulations; installation processes, including spill contingency plans and pollution prevention plans; and procedures for testing, training, operation, maintenance, and D & D should preclude any potential significant environmental impacts associated with execution of the proposed actions: production, testing, training, fielding and operating, maintaining, and D & D of the AMPV.

The environmental impacts related to AMPV are typical of existing military tracked, combat vehicles. It is expected that minimal impacts to air quality, water quality, soil resources, land use, hazardous materials, non-hazardous waste management, noise, transportation, and health and safety could potentially occur at locations where the AMPV is produced, tested, operated, maintained, and demilitarized or disposed of. However, these impacts would be temporary because activities performed with or on the system would be for limited durations at any given facility. In addition, AMPV activities take place at existing facilities where similar activities already occur. These facilities have active programs, plans, and SOPs in place to mitigate potential environmental impacts.

For times of conflict or national emergency in which the AMPV may be deployed by executive order outside of its controlled area, the proposed action is not subject to E.O. 12114 and 32 CFR 651. However, even in this case, without a catastrophic event, significant environmental impacts or hazards to public safety as a result of deploying the AMPV are not anticipated.

Each individual site having AEs will be responsible for determining if additional NEPA analyses is required according to specific use and activities of the AMPV according to site-specific potential impacts. IAW implementing regulations for the NEPA (40 CFR 1508.7), cumulative impacts must be addressed in an EA. A cumulative impact is the "…impact on the environment, which results from the incremental impact of

the action when added to other past, present and reasonably foreseeable future actions…" Although no cumulative impacts have been identified in this LCEA, individual installation NEPA analyses would consider cumulative impacts for AMPV related activities at their specific locations if they are considered significant.

Table 9.0 qualitatively summarizes the impacts to each ERA of specific interest to this analysis according to key life-cycle milestones of the AMPV. The impact categories identified in the table are defined as follows:

- *Insignificant:* Impacts that occur as part of the existence of the AMPV, however remain benign in altering the ecosystem, local and surrounding environments, as well as community socioeconomics and do NOT impart short or long term effects on human or animal health.
- *Minimal:* Impacts that occur temporarily or may be easily repaired or naturally remediated and do NOT present or promote long term change to the hosting ecosystem, local and surrounding environments, community socioeconomics and human or animal health.
- *Significant:* Impacts that directly impart long term change to the ecosystem or environment; or catalyze indirect or cumulative effects to the supporting community, environment, and economy; or promote hazards to human health or wildlife.

Table 9.0: Summary of Environmental Impacts

Environmental Resource Areas	Production	Testing & Evaluation	Training	Fielding & Operations	D&D
Air Quality					
Water Quality					
Soil Resources					
Land Use					
Socioeconomics					
Hazardous Materials & Wastes					
Non-Hazardous Waste					
Noise					
Transportation					
Biological Resources					
Cultural / Historical Resources					
Public Health & Safety					

Insignificant Minimal Significant

Based upon this analysis, it is determined that the proposed action would not have a significant impact upon the environment. As a result, the preparation of an EIS is not required, and a Finding of No Significant Impact (FONSI) has been prepared (Appendix B).

10.0 List of Persons Contacted / Agencies Consulted

Product Manager, Armored Multi-Purpose Vehicle

Combat Capabilities Development Command Ground Vehicle Systems Center, Materials, Environmental, and Corrosion Team

11.0 References

Electronic Code of Federal Regulations, Title 32: National Defense; Part 651: Environmental Analysis of Army Actions (AR 200-2).

Electronic Code of Federal regulations, Title 40: Protection of Environment; Part 1500.

Executive Order 12114 – Environmental Effects Abroad of Major Federal Actions, 44 Federal Register 1957, dated 4 January 1979.

AMPV Request for Proposal, 2014.

AMPV Capability Development Document, Version 1.6, 18 July 2012.

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U.S. Environmental Protection Agency. Toxicological Review of Hexavalent Chromium. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1998.

U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Cadmium. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.

12.0 List of Preparers

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Appendix A: AMPV Hazardous Materials List

Material / Process	Material Usage / Location	Specification
Vehicle Fluids		
Windshield Washer Solvent	Windshield washer reservoir	A-A-59664
Engine Coolant / Antifreeze	Radiator	A-A-52624
Engine Oil	Power train / Drive train	MIL-PRF-2104
Gear Oil	Vehicle differentials	SAE J2360
Engine fuel (JP8 / F24)	Power train, fuel tank and lines	MIL-DTL-83133
Engine fuel (Diesel No.2)	Power train, fuel tank and lines	MIL-DTL-83133
Transmission Oil	Transmission case	MIL-PRF-2104
Hydraulic Fluid	Power steering, transfer case, transmission	MIL-PRF-5606, MIL-PRF-46170, MIL-PRF-6083, MIL-PRF-83282
Automotive Petroleum Grease	Lubrication on frame joints, gears, and other lubrication joints	MIL-PRF-10924
Refrigerant (R-134a)	Vehicle cooling system	
Brake fluid	Brake master and slave cylinders, booster pump, reservoir	
Fire Suppressants		
FM-200	Fire suppression system	
Sodium Bicarbonate	Fire suppression system	
Carbon Dioxide	Fire suppression system	

Material / Process	Material Usage / Location	Specification
Coatings		
Water-based Epoxy Primer	Vehicle structure and parts	MIL-DTL-53030
Corrosion Inhibiting Epoxy Primer	Vehicle structure and parts	MIL-DTL-53022
Water Dispersible Aliphatic Polyurethane Camouflage Coating	Vehicle structure and parts	MIL-DTL-64159
Single-Component, Aliphatic, Polyurethane Chemical Agent Resistant Coating	Vehicle structure and parts	MIL-DTL-53039
Powder Coating, Camouflage Chemical Agent Resistant Coating	Vehicle structure and parts	MIL-PRF-32348
Coating, Epoxy, High-Solids	Vehicle structure and parts	MIL-PRF-22750
Adhesive and Sealers		
Adhesives	Vehicle body and parts	A-A-3097, ASTM D5363, MIL-A-46050, MIL-A-46106, MIL-A-46146, MMM-A-121, MMM-A-1617
Threadlocker Adhesive	Fasteners	
Threadlocker Sealant	Power pack / Drive train	MIL-S-22473
Silicone Based Sealant	Gaskets	
Anti-seize Lubricant Compounds	Fasteners	MIL-A-13881, MIL-T-22361, A-A-58092
Gasket Sealer	Engine	
Miscellaneous		
Cadmium	Electrical connectors and fasteners	
Hexavalent Chromium	Electrical Connectors and fasteners	
Cleaning Compound Solvent	Used to clean vehicle parts and body	MIL-PRF-680
Lead	Engine bearings	

Material / Process	Material Usage / Location	Specification
Miscellaneous		
Beryllium Copper	Electronic connector clips	
Lead Acid Batteries	Batteries	
Tin-Lead solder	Electronics and wire harness	J-STD-001

Appendix B: Finding of No Significant Impact (FONSI)

PROPOSED ACTION:

Production, testing, training, fielding and operation, maintenance, and demilitarization and disposal (D & D) of the Armored Multi-Purpose Vehicle (AMPV).

DISCUSSION:

The proposed action is the execution of the Armored Multi-Purpose Vehicle (AMPV) program which includes production, testing, training, fielding and operation, maintenance, and D & D of the AMPV vehicles. The AMPV will replace the M113 in the Armored Brigade Combat Team (ABCT) at Brigade and below and provide support across the range of military operations (ROMO). The AMPV will provide improved force protection, survivability, mobility, situational awareness, sustainment, and capability for future growth.

In accordance with the National Environmental Policy Act (NEPA) and Title 32 Code of Federal Regulations (CFR) Part 651, Environmental Analysis of Army Actions, Final Rule; Project Manager AMPV has prepared a Life Cycle Environmental Assessment (LCEA) for the AMPV program. It analyzes the potential environmental impacts associated with the production, testing, training, fielding and operation, maintenance, and D & D of the AMPV. Additionally, this LCEA evaluates the No-Action Alternative.

The AMPV LCEA identifies, documents, and evaluates the direct and indirect impacts for the proposed action. Additionally, the LCEA addresses the no-action alternative. The Environmental Resource Areas (ERAs) considered include air quality, water quality, soil resources, land use, socioeconomics, hazardous materials, hazardous wastes, non-hazardous waste, noise, transportation, biological resources, cultural and historical resources, and public health and safety. Due to the fact that several Army organizations at multiple locations will receive the AMPV, the analysis included in this LCEA is limited to ERAs at a programmatic level, meaning it will include a review of potential impacts that are similar at all or nearly all locations where production, testing, training, fielding, operation, maintenance, and D & D of the AMPV will occur.

The environmental impacts related to AMPV are typical of current Army tracked combat vehicles. It is expected that minimal impacts to air quality, water quality, soil resources, land use, hazardous materials, non-hazardous waste management, noise, transportation, and health and safety could potentially occur at locations where the AMPV is produced, tested, operated, maintained and demilitarized or disposed. However, these impacts would be temporary because activities performed with or on the system would be for limited durations at any given facility. Careful adherence to Federal, State, military, and local environmental regulations; installation processes, including spill contingency plans and pollution prevention plans; and procedures for testing, training, operation, maintenance, and D & D should preclude any potential significant environmental impacts associated with execution of the proposed action. Based upon this analysis, it is determined that the potential impacts to the ERAs would be minimal and temporary and the proposed action would not have a significant impact upon the environment.

Receiving organizations and installations are responsible for preparing any additional NEPA analyses required to address unique environmental concerns not assessed within this LCEA or cumulative impacts that are expected to be significant.

The LCEA will be made available to the public for review and comment. Comments must be received no later than 30 days from publication date of the Notice of Availability. To obtain additional information regarding this decision or to request a copy of the AMPV LCEA contact:

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Appendix C: Glossary of Acronyms and Abbreviations

Acronym	Definition
AAE	Army Acquisition Executive
ABCT	Armored Brigade Combat Team
ACAT	Acquisition Category
AE	Affected Environment
AFES	Automatic Fire Extinguishing System
AGM	Absorbed Glass Mat
AMPV	Armored Multi-Purpose Vehicle
AoA	Analysis of Alternatives
APG	Aberdeen Proving Ground
AR	Army Regulation
BOM	Bill of Materials
CAA	Clean Air Act
CARC	Chemical Agent Resistant Coating
CASEVAC	Casualty Evacuation
CCDC	Combat Capabilities Development Center
CDD	Capability Development Document
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO2	Carbon Dioxide
COCO	Contractor-owned, Contractor-operated
CWF	Civil Works Facilities
CX	Categorical Exclusion
D & D	Demilitarization and Disposal
DA	Department of the Army
dB	Decibel

Acronym	Definition
DLA	Defense Logistics Agency
DoD	Department of Defense
E3	Electromagnetic Environment Effects
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMD	Engineering, Manufacturing and Development
ENMP	Environmental Noise Management Program
EO	Executive Order
EPA	Environmental Protection Agency
EPG	Electronic Proving Ground
ERA	Environmental Resource Area
ESOH	Environment, Safety, and Occupational Health
FDC	Fire Direction Center
FONSI	Finding of No Significant Impact
FoV	Family of Vehicles
FRP	Full-Rate Production
FSR	Field Service Representative
FUE	First Unit Equipped
FY	Fiscal Year
GCS	Ground Combat Systems
GHG	Green House Gases
GOCO	Government-owned, Contractor-operated
GP	General Purpose
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HET	Heavy Equipment Transporter

Acronym	Definition
HMMR	Hazardous Materials Management Report
I&KPT	Instructor and Key Personnel Training
IAW	In accordance with
ICRMP	Integrated Cultural Resources Management Plan
IETM	Interactive Electronic Technical Manual
IOT&E	Initial Operation Test & Evaluation
IRIS	Integrated Risk Information System
ISCP	Installation Spill Containment Plan
ITAM	Integrated Training Area Management
JLTV	Joint Light Tactical Vehicle
LAR	Logistics Assistance Representative
LCEA	Life Cycle Environmental Assessment
LCMC	Life Cycle Management Command
LRIP	Low-Rate Initial Production
LRU	Line Replaceable Unit
LUT	Limited User Test
MC	Mortar Carrier
MCmd	Mission Command
MDA	Milestone Decision Authority
ME	Medical Evacuation
MEP	Mission Equipment Package
MIL-DTL	Military Detail Specification
MIL-PRF	Military Performance Specification
MIL-STD	Military Standard
MRAP	Mine Resistant Ambush Protected
MOS	Military Occupational Specialty

Acronym	Definition
MT	Medical Treatment
NDI	Non-Developmental Item
NEPA	National Environmental Policy Act
NET	New Equipment Training
NPDES	National Pollutant Discharge Elimination System
NSE	National Security Exemption
ODC	Ozone Depleting Chemical
OEM	Original Equipment Manufacture
OSHA	Occupational Safety and Health Administration
PdM	Product Manager
PEO	Program Executive Office
PMCS	Preventive Maintenance Checks and Services
POL	Petroleum, Oils, and Lubricants
POWT	Publicly Operated Wastewater Treatment
PPE	Personal Protection Equipment
PQT	Production Qualification Test
RAM	Reliability, Availability, and Maintainability
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROMO	Range of Military Operations
RRAD	Red River Army Depot
RTLP	Range and Training Land Program
SDDP	System Demilitarization and Disposal Plan
SOP	Standard Operating Procedure
SPCCP	Spill Prevention Control and Countermeasures Plan

Acronym	Definition
TACOM - LCMC	TACOM - Life Cycle Management Command
TACP	Tactical Air Control Party
TLM	Two-Level Maintenance
TM	Technical Manual
TMDE	Test Measurement and Diagnostics Equipment
U.S.	United States
VOC	Volatile Organic Compound
VOHAPs	Volatile Organic Hazardous Air Pollutants
WSMR	White Sands Missile Range
YPG	Yuma Proving Ground

Appendix D: Public Notification

NOTICE

Pursuant to the regulations implementing the National Environmental Policy Act (32 CFR 651.14 [b] 2), the Department of the Army gives notice that a Draft Life Cycle Environmental Assessment (LCEA) has been prepared to evaluate potential environmental impacts of the proposed action pertaining to the production, testing, training, fielding and operation, maintenance, and demilitarization & disposal of the Armored Multi-Purpose Vehicle (AMPV). Based on the Draft LCEA, the Army has concluded that the environmental impacts from the AMPV program activities will not be significant. As a result, a Draft Finding of No Significant Impact (FONSI) has been prepared, which concludes that an Environmental Impact Statement (EIS) is not required for the AMPV program. For additional information, comments, or copies of the associated documents, please contact:

Product Manager AMPV – Environmental Engineer **6501 E. Eleven Mile Rd.**

Warren, MI 48397-5000

Office Symbol: SFAE-GCS-AP **Mail Stop: 563**

586-282-9700

usarmy.detroit.peo-gcs.mbx.mav-ops@mail.mil

The Department of the Army will receive comments on this proposal for a 30-day period from the date this notice is published.

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APPENDIX C: Examples of Maneuver Land Sustainment Activities

Examples of plans and activities that have been executed at various installations to support the sustainable use of maneuver training lands include:

- Critical Area Treatment (CAT): CAT is a combination of best management practices (BMPs) and any or all may be required to ensure serviceability of the landscape. This combination of conservation practices is required on severely degraded areas and includes Maneuver Access Structures (MAS), mulch on bare ground, vegetation establishment, maneuver trail maintenance, hillside access trails, pipeline crossing repair, and stream crossing repair. (Fort Hood, 2019)
- Maneuver Damage Program: Program under which training units file a maneuver damage report following training activities and repair damage incurred within their responsibility and capability.
- Training Restricted Area Program (TRAP): Supports maintenance of training land and specifies work areas for training avoidance and safety. As a component of ITAM, Training Requirements Integration (TRI) utilizes the TRAP as an operational program that provides locations for DPW and ITAM work areas and timeframes of work for unit planning and avoidance.
- Construction Site Storm Water Compliance Inspection Program: Requires inspection of construction sites for compliance with the State's Construction General Permit. The areas of inspection include the main cantonment and all training/live-fire areas. Training area storm water management BMPs include the MAS, silt fencing, ripping and seeding, check dams, and right-of-way clearing to ensure tracked vehicles remain in established lanes. (Fort Hood, ITAM)
- Limit access to select areas to ensure soldier safety and minimize environmental degradation (e.g., avoid steep slopes to prevent vehicle roll-over and to prevent erosion from vehicle maneuver training).
- Limit access to select areas, year-round or during specified time periods, to protect critical environmental resources (e.g., nesting bald eagle; thin, fragile, and highly erosive soils; wetlands; archaeological sites).
- Seeding: Re-seed land after a training event to restore native vegetation growth and minimize erosion. Reseed areas where adequate vegetative cover is lacking. Seeding is used on cantonment projects and smaller construction projects. Seed mixes must be a native seed mix and approved by the Natural Cultural Resource Management Branch.
- Conduct prescribed burns to control fuel load and minimize potential for wildland fires resulting from military training live-fire activities or lightning strikes.
- Manage vegetation growth to enable continued off-road vehicle maneuvers or continued use of maneuver trails, which are natural trails that, for the most part, do not incorporate engineered design.

- Grade soils or repair landscape contours after a storm or training event to address soil compaction issues or remove gullies formed from ruts created by vehicles and natural activities.
- Apply dust palliatives to unpaved maneuver area roads to reduce fugitive dust.
- Construct MAS: Also known as “gully plugs”, MAS include the construction of a series of rock check dams in gullies to reduce erosion, contain sediment, and provide maneuver access across gullies. It has been shown that MAS not only slows erosion but has a positive impact by allowing soil deposition and vegetation re-growth within the gully.
- Maintain Riparian Buffers: Maintain riparian vegetative zones to reduce erosion along drainages as well as filter and/or catch sediment before it enters the drainage system.
- Improve Tank Trails: Reduce concentrated erosion by hardening surfaces and channeling water to established runoff areas.
- Sediment retention: Construction and maintenance of sediment catchment basins reduce sediment loads into nearby water bodies.
- Grade soils or repair landscape contours after a storm or training event to address soil compaction issues or remove gullies formed from ruts created by vehicles and natural activities.