

Draft Addendum to the Environmental Assessment
for the
Construction of a Homeland Defense Technologies and Security Readiness Center

RDECOM-ARDEC, Picatinny Arsenal, New Jersey

Second Addendum Environmental Assessment
for the
Conduct of Behavioral Response Testing and Evaluation by the Target Behavioral
Response Laboratory (TBRL) - Phase 2 Outdoor Behavioral Response Tests

RDECOM-ARDEC, Picatinny Arsenal, New Jersey

Submitted to:



Prepared For:

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EXECUTIVE SUMMARY

Conduct of Behavioral Response Testing and Evaluation by the Target Behavioral Response Laboratory (TBRL) - Phase 2 Outdoor Behavioral Response Test

This second addendum to the environmental assessment (EA) for the Construction of a Homeland Defense Technologies and Security Readiness Center (Reference 1) was prepared to evaluate the potential impacts on the physical and human environment from the proposed action to conduct Phase 2 outdoor behavioral response testing and evaluation at the Target Behavioral Response Laboratory (TBRL).

Phase 1 of the TBRL Outdoor Behavioral Response Testing consisted only of the Intelligent Munitions Systems (IMS) Non-Lethal Pyrotechnic Capabilities Test. This test was conducted between August - September 2009.

TBRL has been tasked to conduct outdoor behavioral response tests to assess the behavioral response of test subjects to various audible, visual and projectile stimuli (including no stimuli as a control), during which the test subjects perform physical activities while being subjected to stimuli as described in the last paragraph on this page.

TBRL expects to continue beyond 2009 and into the next few years with experiments/tests involving the use of the same paintballs, and the same visual and auditory stimuli as the Phase 1 tests conducted in 2009. There may be some differences in the experiments (e.g., configuration of stimuli on the test course in full compliance with safety document advisories, quantity of paintballs to be shot), but the same stimuli and paintballs will be used.

However, until a request for a specific experiment is received from a customer, TBRL cannot precisely predict when experiments will be conducted, quantity of paintballs to be shot, stimuli configuration setups on the test course.

For the tests described below and on Table 1 on page 4 of this document, the audible stimuli will be provided by sound generating devices (e.g., Medium Range Acoustic Device (MRAD), Long Range Acoustic Device (LRAD), and a Pipebomb Improvised Explosive Device (IED) Trainer). The visual stimuli will be provided by equipment including laser, flash, and broadband light generation equipment. Projectile stimuli will be provided only by paintballs fired at test subjects equipped with personnel protective equipment (e.g., eye protection, body protection, groin protection, and test subject-operated remote "Stop Test" switches).

The test subject activities under evaluation include the following activities where the test subjects: (1), are subjected to paintball projectile impact while test subject range of motion is restricted by being held in body restraints; (2), conduct mock aggressive actions against vehicular targets while the vehicles are in motion; (3), conduct goal-oriented physical activities on foot while negotiating a pre-positioned test layout; and (4), perform task-oriented driving maneuvers while approaching a mock vehicle control point.

These tasks are required by the Army, and will be, and have been, conducted by the TBRL of the Quality Engineering and System Assurance Directorate (QE&SA), at indoor

locations and outdoor locations at the 3500 Area, and also indoor and outdoor locations on the tarmac only, in the 3800 Area, of RDECOM-ARDEC.

The underlying need for the proposed action is to enhance the Soldiers' and Homeland Security Forces' performance and survivability by ensuring knowledge of threat assessment under stress, as provided by light generation equipment, sound generation devices, and projectile (i.e., paintball) stimuli; in cargo convoy operation scenarios, task-oriented driving scenarios, and mock tactical checkpoint operational scenarios. The following alternatives, designed to meet the purpose and underlying need, are evaluated in this 2nd Addendum EA.

- **Preferred Alternative:** The preferred alternative is the proposed action – to continue the conduct of behavioral response testing and evaluation by outdoor investigation of the use sound generation devices, light generation equipment, and projectile (i.e., paintball) delivery devices.
- **No Action Alternative:** The no action alternative would be not to conduct the aforementioned Phase 2 testing and evaluation. This alternative is entirely unacceptable due to increased danger to Soldier and Homeland Security Force personnel resulting from behavioral response uncertainty under simulated stress and threat assessment conditions, and consequent increased Soldier and Homeland Security Force personnel vulnerability.
- **Alternatives Considered And Rejected:** An alternative considered and rejected was the construction and operation of the Homeland Defense Technologies and Security Readiness Center within the main Picatinny Arsenal fence-line, and to also site the TBRL within the main Picatinny Arsenal fence-line. The existing infrastructure and potential availability of a large tract of land, as well as locating the TBRL facility away from the normal working environment of the Arsenal was considered to be more feasible.

Analysis of impacts on current air resources; water resources; soil and geologic resources; biological resources; cultural, historical, and aesthetic resources; the socioeconomic environment and environmental justice; hazardous materials; and hazardous waste/solid waste, was conducted to determine if the proposed action would adversely impact any of those resources. This EA concludes that the proposed action would not have any significant adverse impacts on the resources examined herein. The proposed action would cause minor adverse impacts on several resources of the proposed site, but those impacts would be insignificant and would be reduced through the implementation of a variety of mitigation measures. Therefore, the preparation of a Notice of Intent (NOI) to prepare an environmental impact statement (EIS) is not warranted at this time. This decision will be documented through a finding of no significant impact (FNSI).

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide for training of military personnel, federal and civilian law enforcement, and federal, state, and local first responders to include police, fire and rescue, emergency medical system (EMS), special weapons and tactics (SWAT), and hazardous material (HAZMAT) personnel that respond to terrorist or other types of catastrophic events that threaten national security. The underlying need for the proposed action is to enhance the Soldiers' and Homeland Security Forces' performance and survivability by ensuring knowledge of threat assessment under simulated stress conditions, as provided by light generation equipment, sound generation devices, and projectile (i.e., paintball) stimuli; in cargo convoy operation scenarios, task-oriented driving scenarios, goal-oriented physical activity scenarios, and mock tactical checkpoint operational scenarios.

This 2nd EA addendum was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), (Title 42 of the United States Code [U.S.C.] 4321 through 4347); the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] parts 1500 through 1508) for Army Actions; *Protection of the Environment*, Code of Federal Regulations (40 CFR, part 280); U.S. Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*; AR 200-2, *Environmental Effects of Army Actions*, as set forth in 32 Code of Federal Regulations (CFR) Part 651 (Final Rule), dated 29 March 2002; and AR 200-3, *Natural Resources – Land, Forest, and Wildlife Management*.

2.0 GENERAL DESCRIPTION OF PROPOSED ACTION

The proposed action involves outdoor investigation of the use of sound generation devices, broadband light/laser light/flash-strobe light generation devices, and paintballs to be used as projectile stimuli; to be used as stimuli to evaluate the behavioral response of test subjects when subjected to the stimuli. A no-stimuli test series is proposed for each of the six (6) tests listed below as a control group. The behaviors which will be tested for response to stimuli include mock aggressive actions (e.g., throwing “rocks”) at moving vehicles, response of drivers to stimuli while performing goal-oriented driving activities (e.g., driving through a serpentine course, response of test subjects while in motion on foot and performing goal-oriented physical activities on a pre-positioned course, and driving in a mock lane approaching a mock checkpoint).

The best way to ensure Soldiers' and Homeland Security Forces' survivability and enhanced performance; is to ensure compliance with orders/commands issued by checkpoint operators, and to keep aggressive combatants away from them. Placement of sound, light, and projectile stimuli generators in the control of checkpoint operators may present a simple, cost-effective way to achieve these objectives. The TBRL is conducting and will continue to conduct the human behavioral response testing and evaluation, and will provide the Army with the data needed to make informed decisions as to the placement and use of sound generation, light generation, and tactical projectile delivery devices. As the TBRL has most of the infrastructure in place for this type of experimentation, only minimal additions to the measurement gathering systems need to be implemented or installed before the experimental testbed is ready for testing.

The plan for the light generation device behavioral response testing and evaluation is for test subjects to each be subjected to pulses of laser light, broadband light, and flash/strobe light, during execution of goal-oriented driving tasks, while acting as aggressive combatants, and negotiating a closed driving course while being subjected to the light stimuli. Similarly, the plan for the sound generation device behavioral response testing and evaluation and projectile delivery device behavioral response testing and evaluation; is to evaluate test subject behavior during execution of tasks described in the previous sentence, while being subjected to the stimuli.

The test plan includes evaluating the behavioral response while test subjects are subjected to: (1), no stimuli, and also combinations of light, sound, and projectile stimuli, including all three stimuli simultaneously. All of these evaluations have taken place or are taking place outdoors, and indoors for the Blunt Impact Exposure Test, within the confines of the approximately 5-acre 3500 area, and also the confines of the 3800 Area only on surfaces covered by tarmac, on and adjacent to the helicopter pad.

The following tests are covered in this 2nd Addendum:

- .1. Effectiveness of Hail/Warn Flashbangs Under Task-Oriented Driving Scenarios
- .2. Multisensory Disruption Convoy Protection/Checkpoint
- .3. Convoy Protection – Aggressive Acts Effectiveness Training
- .4. Lasers for Hail/Warn and Suppression in a Tactical Checkpoint Scenario
- .5. Tactical Checkpoint Evaluation (Laser, Paintball, and Broadband Light), and
6. Use of Pyrotechnics to Deter Approach

Table 1 on the next page is a roll-up of test locations, , stimuli employed, and materials consumed during each test.

For the tests outlined in Table 1 on the next page, the audible stimuli will be provided by sound generating devices including a Medium Range Acoustic Device (MRAD) and Long Range Acoustic Device (LRAD) manufactured by American Technology Corporation, and a Pipebomb Improvised Explosive Device (IED) Trainer manufactured by Combat Training Solutions, Inc.

The visual stimuli will be provided by equipment including laser, flash, and broadband light equipment. Laser equipment to be used for the TBRL Phase 2 Behavioral Testing includes the Green Beam Designator IIIC green beam laser (GBD-IIIC Laser) manufactured by B.E. Meyers & Co., and the Warning Laser System G4 (WLS-G4) warning laser system manufactured by nLight Photonics Corporation.

Flashing light stimuli will be provided in red light, green light, and white light; by equipment including a Diversitronics Mark 2000 Theatrical Strobe Light and a Bowens Esprit 2 1500 Flash Lamp.

Broadband light stimuli will be provided by equipment including a Peak Beam Systems Maxa Beam Searchlight, and the following three pieces of equipment manufactured by Electronic Theatre Controls (ETC), Inc:

- .1. ETC Source Four 5 Degree Spotlight
- .2. ETC Source Four 10 Degree Spotlight
- .3. ETC Source Four 19 Degree Spotlight

Projectile stimuli will be provided by paintballs fired from an AT-4 Paintball Gun. The paintballs to be provided will include paintballs manufactured by Zap Paintball, Inc., Pharmagel Corporation, and Severe Paintball LC.

During the physical activity test while test subjects perform goal-oriented activities while moving on foot, the test subjects will be subjected to projectile (i.e., paintball) stimuli before being subjected and while being subjected to a combination of auditory and visual stimuli. The auditory and visual stimuli will be activated by the test subject as the subject crosses a line and activates a position switch during approach to a goal set up to measure/assess performance of the goal-oriented activity. The time length of each stimulus, and the order in which the stimuli will be generated; will be randomized and will vary subject-to-subject, for purposes of recording and analyzing different response behaviors on a subject-to-subject basis.

This task is required by the Army, and will be completed by the TBRL of the Quality Engineering and System Assurance Directorate (QE&SA), in outdoor locations within the 3500 Area of Picatinny Arsenal, and also indoor and outdoor locations on the tarmac only, in the 3800 Area, of Picatinny Arsenal.

#	Name	Approximate # of Days of Testing	# of Trials/Test/Day	# of Test Subjects	# of Operators	Paintball	Sound	Broadband Light	Laser	FlashBang/Pyro	Duration of Stimulus per Day	Location of Experiments
1	Effectiveness of Hail/Warn Flashbangs Under Task Oriented Driving Scenarios	15	Varies	2	5					X	10 Warning Munitions	3800 AREA
2	Multisensory Disruption Convoy Protection/Checkpoint	15	Varies	2	4				X		5 min laser	3500 AREA
3	Convoy Protection - Aggressive Acts Effectiveness Training	4	Varies	6	7	X	X	X			2000 paintballs 10 min light/sound	3500 AREA
4	Lasers for Hail/Warn and Suppression in a Tactical Checkpoint Scenario	20	Varies	2	5				X		5 min laser	3800 AREA
5	Tactical Checkpoint Evaluation (Laser, Paintball, and Broadband Light)	15	Varies	2	5	X	X	X	X		50 paintballs 5 min laser/light/sound	3800 AREA
6	Use of Pyrotechnics to Deter Approach	20	Varies	2	3	X		X		X	4 Pyrotechnics 50 paintballs 2 min light	3500 AREA

Table 1, Roll-up of Proposed Test Locations, Stimuli Employed, and Materials To Be Consumed During Each Test

3.0 ALTERNATIVES CONSIDERED

- **Preferred Alternative:** The preferred alternative is the proposed action – to conduct behavioral response testing and evaluation by outdoor investigation of the use of sound generation, light generation, and projectile (i.e., paintball) delivery devices to be used as a warning/deterrence measure to keep deployed personnel at a mock checkpoint safe from aggression and hostile activity/activities by “enemy combatant” test subjects.
- **No Action Alternative:** The no action alternative would be not to conduct the aforementioned Phase 2 testing and evaluation. This alternative is entirely unacceptable due to increased danger to Soldier and Homeland Security Force personnel resulting from behavioral response uncertainty under simulated stress and threat assessment conditions, and consequent increased Soldier and Homeland Security Force personnel vulnerability.
- **Alternatives Considered And Rejected:** An alternative considered and rejected was the construction and operation of the Homeland Defense Technologies and Security Readiness Center within the main Picatinny Arsenal fence-line, and to also site the TBRL within the main Picatinny Arsenal fence-line. The existing infrastructure and potential availability of a large tract of land, as well as locating the TBRL facility away from the normal working environment of the Arsenal was considered to be more feasible.

4.0 ENVIRONMENTAL IMPACTS OF PROPOSED ACTION

4.1 AFFECTED ENVIRONMENTS

The affected environments from the proposed TBRL Phase 2 Outdoor Testing are incorporated by reference to the existing approved environmental assessment document entitled Environmental Assessment (EA) for the Construction of a Homeland Defense Technologies and Security Readiness Center, dated May 2003” (Reference 1). Further analysis of the affected environments from the proposed TBRL Phase 2 Outdoor Testing is set forth below:

Table 2; Valued Environmental Components for Analysis

Valued Environmental Component	Level of Analysis
Aesthetics	No negative impact has occurred as a result of outdoor TBRL testing activities. A net positive impact has occurred from building maintenance activities (e.g., masonry repairs, painting) supporting the TBRL establishment, and area landscaping, paving, and walkway and curb installation activities in support of installing outdoor test areas at the TBRL.
Airspace	<p>No anticipated negative impact due to conducting outdoor experiments at the TBRL. Procedures are in place to prevent inadvertent pointing of laser light beams in the direction of aircraft. Per discussion with TBRL representatives, all laser light equipment is either mounted on fixed equipment with fixed azimuth and elevation, or operated by TBRL test operator personnel in strict accordance, including strict requirements for prior notification, with established procedures staffed through and approved by the ARDEC Safety Office.</p> <p>In regards to equipment used by the TBRL to generate visual stimuli (i.e., laser, flash, and broadband light equipment) hazards analyses/evaluations were performed by the US Army Center for Health Promotion and Preventive Medicine (CHPPM) and the US Navy Laser Safety Review Board (LSRV) on the equipment, as required prior to granting approval for use of the equipment, for determination of safe operational parameters including nominal ocular hazard distances (NOHDs), nominal skin hazard distances (NSHDs), maximum safe exposure times/durations, and safe operating procedures in general.</p>

<p>Airspace (continued)</p>	<p>For all light stimuli generation equipment used by the TBRL, the referenced hazard analyses/evaluations (Reference 11), set forth requirements prior to approval for use, including: (1), preparation of safety Standard Operating Procedures (SOPs); (2), reporting requirements for suspected injuries; (3), consideration of adverse effects from temporary visual impairment and possibility of induced epileptic seizures; and (4), advisories/recommendations for personnel exposed to not attempt to overcome their natural aversion response.</p>
<p>Noise</p>	<p>There will be mitigable noise impacts from operation of the auditory noise generation devices during the TBRL Phase 2 Outdoor Behavioral Response Testing. There will be no noise impacts from operation of the visual stimuli generation devices, and low decibel (e.g., less than 80 decibels absolute (dBA) noise events from firing of the AT-4 Paintball Gun, during the conduct of the TBRL Phase 2 Outdoor Behavioral Response Testing.</p> <p>The sound generation devices to be employed by TBRL during the Phase 2 Behavioral Testing effort include a Pipe Bomb Improvised Explosive Device (IED) Trainer, manufactured by Combat Training Systems, Inc, and a Medium Range Acoustic Device (MRAD) and Long Range Acoustic Device (LRAD).</p> <p>The Pipe Bomb IED Trainer contains no energetic material, and generates an approximate 150 decibels absolute (dBA) impulse noise event by release of compressed gas or compressed carbon dioxide. It produces a twenty-foot high non-toxic smoke signature and can be activated via wireless or command wire. It is completely safe for direct contact and can be detonated in very close proximity to training personnel wearing appropriate hearing protection without harming individuals in the vicinity. Per discussion with TBRL test operator representatives, all Pipe Bomb IED Trainer impulse noise events were generated during indoor operation of the Pipe Bomb IED Trainer.</p> <p>The MRAD and LRAD acoustic devices emit maximum noise pulses of 146 dBA at one meter. The LRAD has a maximum volume of 95 dBA at 300 meters. No maximum volume specification at 300 meters is specified for the MRAD. The MRAD and LRAD units are man portable, highly directional sound generation devices with minimal lobing to the sides and rear of the device, to help reduce the risk of exposing nearby personnel or peripheral</p>

<p>Noise (continued)</p>	<p>bystanders to excessive noise levels. Per discussion with TBRL test operator representatives, the maximum volume setting to be used for the MRAD and LRAD during all experiments covered in this EA is 130 dBA at one meter.</p> <p>The LRAD and MRAD noise beam width can be adjusted between a narrow setting of 15⁰ and a wide setting of 30⁰.</p> <p>The MRAD and LRAD operating instructions include a safety fan of 50 meters while the units are in continuous operation. No adverse environmental impacts have been identified for the sound devices proposed for use by the TBRL for the Phase 2 Behavioral Testing.</p> <p>Refer to the referenced (Reference 3) MRAD and LRAD Operations and Safety Manuals, and the referenced (Reference 4) Specification Sheet for the Pipe Bomb IED Trainer for additional information.</p>
<p>Traffic and Transportation</p>	<p>No negative impact was observed during previously conducted outdoor testing at the TBRL, and no negative impact is foreseen from the proposed conduct of Phase 2 TBRL Outdoor Behavioral Response Testing.</p>
<p>Facilities</p>	<p>No to minimal impact. Positive impact resulted from completion of renovation of building 3518 & landscaping improvements to surrounding area.</p>
<p>Wetlands</p>	<p>No anticipated negative impact. None of the proposed TBRL Phase 2 Outdoor Testing will take place in areas determined to be sensitive. Wetland/stream buffers are shown in the Picatinny Arsenal Real Property Master Plan. (Reference 2)</p>
<p>Threatened and Endangered Species</p>	<p>Reply to USF&WS Comments:</p> <p>In regards to one Threatened / Endangered Species, the Indiana Bat, Indiana Bat roost sites are known to exist at Picatinny Arsenal lands bordering the 3518 Area. No information or data on bat behavior or Indiana Bat behavior at Picatinny Arsenal during TBRL test activities has been identified. Indiana bats are observed every 5 years in full compliance with the Endangered Species Act. However, this is insufficient for a bat population that is present every year, and is insufficient to support a finding</p>

<p>Threatened and Endangered Species (continued)</p>	<p>of no impact.</p> <p>TBRL conducted a sound measurement study of the MRAD sound generation equipment (see description on page 7) where the MRAD was operated at 130 dB, and a noise measurement was taken 67 meters away from the MRAD location, at a location next to a tree where Indiana Bat roosting behavior has been observed. A noise level of 107 dB was measured. It is noted that this measured noise level is lower than the typical noise generation of a helicopter of 110 dB. Refer to Figure 1 on Page 17 of this EA document for a depiction of the 3500 Area Indiana Bat Sound Measurements.</p> <p>The TBRL Environmental Management Team was advised by the ARDEC Natural Resources Manager of a previous biological resources impact evaluation conducted previously at Fort Knox, KY, by the US Army Corps of Engineers Waterways Experiment Station (USCOE-WES) Biological Team. The USCOE-WES scope of work was to assess the impact on biological resources bordering weapon firing positions at Fort Knox, from conducting munition (small caliber through large caliber (e.g., 105mm/155mm projectile) firings, as well as helicopter maneuvers. The WES study was “designed to evaluate the impacts of military training noise on the foraging and roosting behavior of bats” (Reference 10). The USCOE – WES Study was the only study identified that assessed the impact of nighttime military noise on bat behavior.</p> <p>The USCOE-WES Biological Team concluded that there is no significant impact to flora and fauna that border weapon firing positions, from the performance of a limited number of munition firings. Excerpts from Reference 10, USCOE-WES Report entitled “An Investigation of Military Training Noise Impacts on Endangered Bats”, dated 5 January 2004, are set forth below:</p> <p>The WES Biological Team, including Research Wildlife Biological professionals, was contacted about the Reference 10 documentation of a study performed by WES at nine (9) sampling locations in 2002 and eight (8) sampling locations in 2003 at Fort Knox to “investigate the potential impacts of military training noise, including high-caliber weapons fire (HCWF) on endangered bat species”, (including the Indiana Bat). In the studies, standard mist-netting, detection of ultrasonic bat vocalizations, thermal infrared (TIR) imagery, and noise</p>
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<p>Threatened and Endangered Species (continued)</p>	<p>monitoring technologies were employed. No Indiana Bats were caught during mist-net surveys (Para 1 Page 6, Reference 10).</p> <p>WES recorded 241 passive sound events during the 2002 evaluations and 65 passive sound events during the 2003 evaluations. The 8 sampling locations surveyed during the 2002 evaluations “represent over 300 hours of passive sound activity.” The evaluations were conducted during ten (10) data sessions at five (5) study locations during the 2002 field season and over sixteen (16) nights during the 2003 field season (Reference 10)</p> <p>Results included at least one instance in which highly circuitous tracks, which “probably indicate that the bat was involved in feeding activity”, were observed and recorded (Figure 3, Page 7 of Reference 10). This is one instance, although a statement of conclusion was not set forth, showing that the nighttime activities and noise events at Fort Knox are “not likely to adversely affect” bat populations based on observed behavior.</p> <p>The report stated that WES “will continue to analyze data and subject the data to rigorous analysis before drawing conclusions as to the impact of military training noise on endangered bat species.” (Reference 10). Information from findings examined to date “generally indicates somewhat consistent bat activity throughout an evening of firing” (Reference 10).</p> <p>It is noted that the proposed testing by TBRL would be conducted during the day between 75 – 80% of the time (Reference 13), and that the impact to bat populations is primarily a nighttime impact. Also, the operational noise levels of the TBRL sound generation equipment have been mandated by procedure not to exceed 130 dB at one meter, and have been measured to generate a noise level of 107 dB at 67 meters, the distance from the sound generation equipment to a tree known to be a roosting and foraging site for the Indiana Bat at Picatinny Arsenal. The measured level of 107 dB at the known Indiana Bat roosting location is less than the 110 dB helicopter operational noise level, and less than one hundredth (1%) of the impulse noise levels of over 140 dB encountered during High Caliber Weapons Fire (HCWF).</p>
<p>Safety</p>	<p>No impact. All stimuli employed by the TBRL during previously conducted outdoor testing and planned for use</p>

	<p>during the proposed conduct of Phase 2 TBRL Outdoor Behavioral Response Testing has been assessed, as required, for operational hazards and health hazards prior to use. (References 3, 8, 11).</p> <p>All Standard Operating Procedures (SOPs) for use of light stimuli, sound stimuli, and projectile (i.e., paint ball) stimuli were staffed through the ARDEC Safety Office, the US Army Center for Health Protection and Preventive Medicine (CHPPM), and/or the US Navy Laser Safety Review Board, as appropriate, prior to approval for use. (Reference 11)</p>
Recreation	No to minimal impact.
Socioeconomics and Environmental Justice	Level of analysis addresses natural resource impacts. No significant adverse impacts from the use of visual stimuli, auditory stimuli, and projectile (i.e., paintball) stimuli from the proposed conduct of Phase 2 Outdoor Behavioral Response Testing and evaluations at TBRL are foreseen. Refer to Reference 1 for additional information.
Soil Contamination / Soil Erosion	No significant adverse impacts to the soil from the visual stimuli, auditory stimuli, and projectile (i.e., paintball) stimuli during the proposed Phase 2 Outdoor Behavioral Response Testing and evaluations at TBRL are foreseen. No significant adverse impacts to the soil were identified or observed from the operation of visual stimuli, auditory stimuli, and projectile (i.e., paintball) stimuli during previously conducted outdoor testing at the TBRL. Refer to the MSDSs for the paintballs used by the TBRL (Reference 8), Table 3 on page 12 of this document, and Table A-1 in Appendix A of this document, for further details on the paintball ingredients/ingredient toxicity.
Hazardous Material/Hazardous Waste	No impact from Hazardous Materials or Hazardous Waste. There will be no hazardous materials used, nor hazardous wastes generated from the use of visual stimuli, auditory stimuli, and projectile (i.e., paintball) stimuli from the conduct of Phase 2 Outdoor Behavioral Response Testing and evaluations at TBRL, since none of the visual, auditory stimuli generation devices, nor the

Water Resources
(continued)

Safety Data Sheets [MSDSs] for Zap Paintballs, Pharmagel Paintballs, and Severe Paintballs).

An analysis of Environmental Fate and Toxicity of solid and liquid paintball combustion products was performed and documented in this environmental assessment for the Zap paintballs, Pharmagel paintballs, and Severe paintballs; and is set forth as follows:

The fate of the non-toxic and water-soluble ingredients in the paintballs would be the deposition of the same onto the terrestrial environment of the 3500 area, where they would be incorporated into the soil colloids, be available for uptake by the plant or microbial communities. Insoluble compounds would become available for transport with water run-off. The paintball ingredients are not volatile, and will not mix or move from the soil into the air.

The daily generation of by-products from function of paintballs during the TBRL Phase 2 Outdoor Behavioral Response Testing and evaluation is expected to be between 50 paintballs and 2000 paintballs per day. The maximum quantity of 2000 paintballs per day will occur during the Convoy Protection – Aggressive Acts Effectiveness Training test. As stated previously, there is a requirement for daily cleanup of paintball residue from TBRL testing (Reference 12).

At a measured weight of the 0.68 Caliber paintballs of 3 grams per paintball, the proposed daily generation of between 150 grams (0.3307 pounds) and 6000 grams (13.2275 pounds) of paintball residue will take place at either the 3500 Area, or on the tarmac at the 3800 Area. The Convoy Protection – Aggressive Acts Effectiveness Training test was conducted entirely on the tarmac at the 3800 Area. As stated previously, there is a requirement for daily cleanup of paintball residue from TBRL testing (Reference 12).

Table 2 below is a roll-up of MSDS information on ingredients contained in Zap paintballs, Pharmagel paintballs, and Severe paintballs. Composition data on the proportion of each ingredient in the three (3) different paintballs is company proprietary and is not provided on the MSDS for each of the 3 different paintballs.

<u>Zap</u> <u>Paintballs</u>	<u>Pharmagel</u> <u>Paintballs</u>	<u>Severe</u> <u>Paintballs</u>

Polyethylene glycol	Polyethylene glycol	Polyethylene glycols
Gelatin	Gelatin	Plasticized gelatin
Glycerine	Glycerine	Glycerol
Sorbitol	Sorbitol	Water
Water	Water	Food grade dyes
Approved colorants	Approved colorants	

Table 3 – Roll-up of Ingredients in Zap Paintballs, Pharmagel Paintballs, and Severe Paintballs

No hazardous ingredients reportable under the United States Code of Federal Regulations (CFR) Part 1910.1200 are identified in the MSDSs for paintballs manufactured by Zap Paintball, Inc.; Pharmagel Corporation; and Severe Paintball LC.

There have been no reports of adverse impacts to flora and fauna in the Bldg 3500 Area from firing of paintballs during previous outdoor testing conducted by the TBRL, based on discussions with the ARDEC Natural Resources Manager in July 2009. Refer to Section 4.5 starting on the next page of this document for a discussion on potential impacts to Endangered Species, specifically the Indiana Bat.

Table A-1 in Appendix A of this EA is a roll-up of toxicology information, Threshold Limit Value (TLV) information as compiled by the American Conference of Governmental Industrial Hygienists (ACGIH), and occupational safety and health (ESOH) information from the MSDSs for each of the 3 different paintballs used (or being used) during the TBRL experiments.

It is noted that all ingredients in the paintballs are relatively nontoxic, with Oral Rat LD₅₀ data ranging from 4.09 grams/kilogram body weight for glycerine to upwards of 50 grams/kilogram body weight or more for certain polyethylene glycols. In comparison, similar LD₅₀ data for table salt (e.g., sodium chloride) of 3.0 grams/kilogram body weight has been published. Refer to Appendix A for additional information.

Water Resources
(continued)

Air Quality

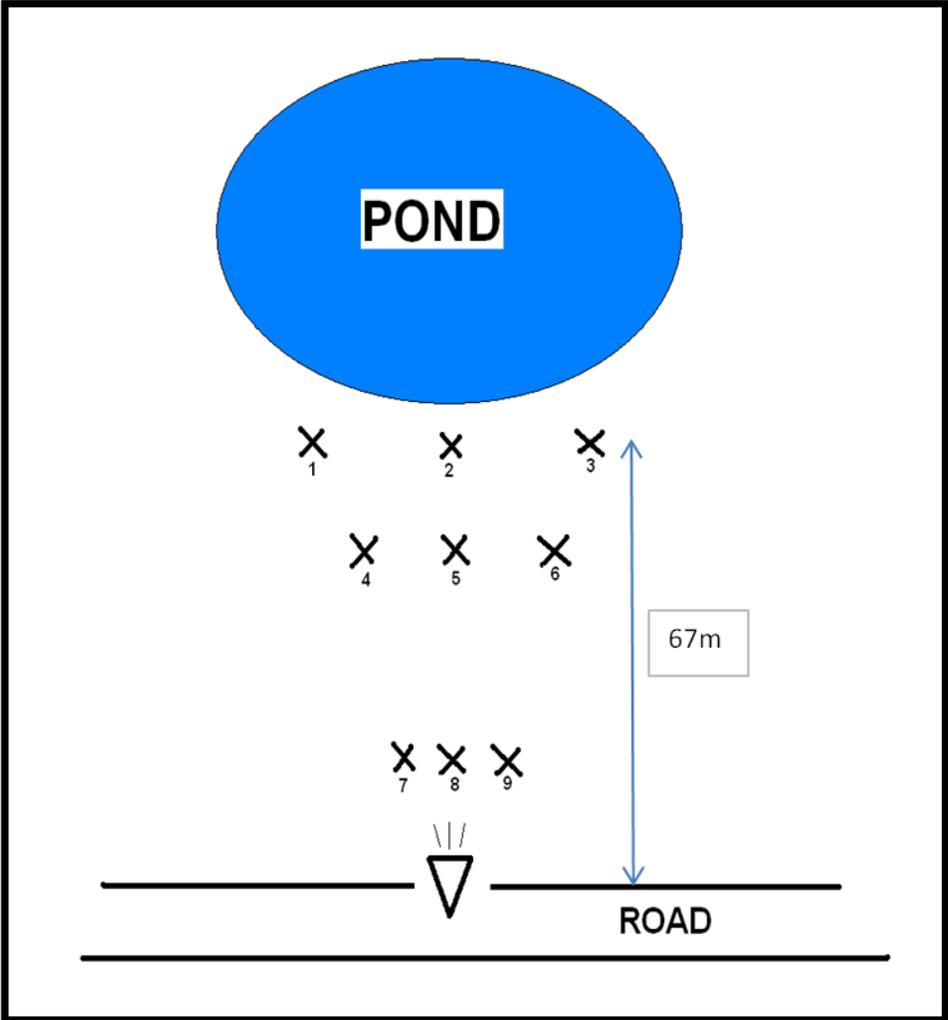
Air impacts have been observed to be minimal to nonexistent during previous conduct of Outdoor Behavioral Response Testing by the TBRL. There is a limited amount of airborne exhaust releases from

	<p>operation of gasoline powered and diesel fuel powered test support vehicles, and also gasoline and diesel fuel powered generators, during the proposed conduct of the TBRL Phase 2 Outdoor Behavioral Response Testing.</p> <p>Per discussion with TBRL representatives, the aforementioned gasoline powered and diesel fuel powered generators are permitted with respect to the facility-wide air permit, and specifications on these generators have been provided to the ARDEC Environmental Affairs Office.</p> <p>However, there will be no airborne releases generated during operation of the visual and auditory stimulus generation equipment. There will also be no airborne releases generated from combustion of energetic materials during operation of the AT-4 paintball gun, since the AT-4 paintball gun uses compressed carbon dioxide to propel the paintball out of the gun.</p>
Solid Waste	<p>There will be no anticipated negative impact from solid waste. All solid wastes generated during the performance of indoor and outdoor experiments at the TBRL have been and will continue to be handled in strict accordance with regulations.</p>
Floodplains	<p>Per TBRL Standard Operating Procedure (SOP) entitled "Experimentation Conducted at the 3500 Area by TBRL" (Reference 5), the review of which resulted in ARDEC being granted an Assurance for Human Research signed by the Assistant Surgeon General for Force Protection on 16 May 2008 and which includes a Human Research Protection Plan (HRPP) dated 9 May 2008 (ARDEC-HRPP-08000, Reference 9) and also a local Institutional Review Board (IRB), none of the Phase 2 Outdoor Behavioral Response Testing and evaluations will take place in areas determined to be sensitive (i.e., defined as all surface water, wetlands and wetland/stream buffers are shown in the Picatinny Arsenal Real Property Master Plan, Figure 5-2 Natural Constraints) (Reference 2).</p> <p>Also per Reference 2, none of the Phase 2 Outdoor Behavioral Response Testing and evaluations will take place in areas designated as Floodplain, Wetlands, or adversely affected by Stormwater.</p>
Stormwater	<p>Per TBRL Standard Operating Procedure (SOP) entitled "Experimentation Conducted at the 3500 Area by TBRL" (Reference 5), the review of which resulted in ARDEC</p>

being granted an Assurance for Human Research signed by the Assistant Surgeon General for Force Protection on 16 May 2008 and which includes a Human Research Protection Plan (HRPP) dated 9 May 2008 (ARDEC-HRPP-08000, Reference 9) and also a local Institutional Review Board (IRB), none of the Phase 2 Outdoor Behavioral Response Testing and evaluations will take place in areas determined to be sensitive (i.e., defined as all surface water, wetlands and wetland/stream buffers are shown in the Picatinny Arsenal Real Property Master Plan, Figure 5-2 Natural Constraints) (Reference 2).

Also per Reference 2, none of the Phase 2 Outdoor Behavioral Response Testing and evaluations will take place in areas designated as Floodplain, Wetlands, or adversely affected by Stormwater.

3500 Indiana Bat - Sound Measurements



Position	Decibel (dB)
1	96
2	107
3	94
4	101
5	111
6	102
7	110
8	128
9	109

Note
 There are no plans to use any type at levels greater than 67 meters from the pond. Measurements will always be aimed from the road.

Note

Position 2 corresponds to a
Indiana Bats have been ob
5, 8 are located normal to
(max possible power at the
from the source). Addition
calculated closely follow th
for sound decay (every dou
sound level drops by 6dB)

4.2 Potential Cumulative Impacts

No potential cumulative impacts from operation of equipment at TBRL in support of the proposed Phase 2 Outdoor Behavioral Response Testing and evaluations are foreseen. Refer to Reference 1 for additional information.

4.3 Irreversible and Irretrievable Commitment of Resources

No impact from operation of equipment at TBRL in support of the proposed Phase 2 Outdoor Behavioral Response Testing and evaluations are foreseen. Refer to Reference 1 for additional information.

5.0 Conclusions

A review of the Building 3518 Stormwater Control Plan, Operator Manuals, Specification Sheets, and MSDSs for the proposed visual stimuli generation equipment, auditory stimuli generation equipment, and projectile (i.e., paintball) delivery equipment to be evaluated during the proposed Phase 2 Outdoor Behavioral Response Testing and evaluations at TBRL identifies that all materials are toxicologically and environmentally acceptable, and that documented mandated procedures for daily clean-up of paintball residue are in place. (References 3, 4, 8, 11, and 12).

No adverse environmental impacts have been identified for the sound generation devices and light generation devices proposed in use by the TBRL for the ongoing Phase 2 Outdoor Behavioral Testing.

Therefore, the preparation of a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) is not warranted at this time. This decision is documented in the Finding of No Significant Impact (FNSI) submitted as an attachment to this EA.

6.0 Organizations and Persons Contacted

Gordon Cooke, AMSRD-AAR-QEW-C
Kevin Tevis, AMSRD-AAR-QEW-C
Kenneth Yagrish, AMSRD-AAR-QEW-C

Wesley G. Myers, IMNE-PIC-PWE
Thomas Solecki, IMNE-PIC-PWE
Jonathan Van De Venter, IMNE-PIC-PWE

Trish Boyce, RDAR-MEE-E
Darrell Evans, Waterways Experiment Station
Chester Martin, Waterways Experiment Station

REFERENCES

- .1. Environmental Assessment (EA) for the Construction of a Homeland Defense Technologies and Security Readiness Center, dated May 2003.
- .2. Picatinny Arsenal Real Property Master Plan, Figure 5-2, Natural Constraints.
- .3. Medium Range Acoustic Device (MRAD) and Long Range Acoustic Device (LRAD) Operations and Safety Manuals
- .4. Specification Sheet for the Pipe Bomb Improvised Explosive Device (IED) Trainer
- .5. Target Behavioral Response Laboratory (TBRL) SOP entitled "Experimentation Conducted at the 3500 Area by TBRL", dated June 2008.
- .6. The Clemson University Cooperative Extension Service - Fertilizing Lawns.
- .7. Soil "Microsoft™ Encarta Online Encyclopedia 2001 <http://Encarta.msn.com> Copyright 1997 - 2001 Microsoft Corporation. All rights reserved.
- .8. Material Safety Data Sheets [MSDSs] for Zap Paintballs, Pharmagel Paintballs, and Severe Paintballs
- .9. Human Research Protection Plan (HRPP), dated 9 May 2008 (ARDEC-HRPP-08000)
- .10. USCOE-WES Report entitled "An Investigation of Military Training Noise Impacts on Endangered Bats", dated 5 January 2004
- .11. Hazards Analyses/Evaluations prepared by the US Army Center for Health Promotion and Preventive Medicine (CHPPM) and the US Navy Laser Safety Review Board (LSRB), between Feb 06 and Oct 08, for Light Stimuli Generation Equipment Used by the TBRL.
- .12. Building 3518 Stormwater Control Plan, last updated on 9 July 2009, Picatinny Arsenal Environmental Management Systems Portal
- .13. Email, Mr. K. Tevis, TBRL, to Mr. J. Dowden, 19 Mar 10, Subject: TBRL Nighttime Testing

APPENDIX A

Roll-up of Toxicology Information, Threshold Limit Value (TLV) Information as Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH), and Occupational Safety and Health (ESOH) Information for Each of the 3 Different Paintballs Used (or Being Used) During the TBRL Experiments

Table A-1 (continued) – Roll-up of Toxicology Information, ACGIH-Compiled TLV Information, and Environmental, Safety and Occupational Health (ESOH) Information for Ingredients Contained in Paintballs Used During TBRL Experiments

<u>Composition / Constituents</u>	National Toxicology Program (NTP)	ACGIH Threshold Exposure limits/OEL (8-Hour TWA)	IARC Threshold Exposure limits	NIOSH Threshold Exposure Limits/ TWA	Carcinogenicity / Animal Studies, & Incompatibilities	OSHA mg/m ³ Threshold Exposure limits /PEL Carcinogen* & Note(s) on Flammability	Suggested PPE	Notes; (e.g., Disposal/ Transportation DOT/International Considerations) Health Hazards: Exposure Routes (ER), symptoms (SY), target organs (TO)
Polyethylene glycol	No	10 mg/m ³	None	None	Oral Rat LD ₅₀ for: PEG 200: 28gm/kg; PEG 300:27.5gm/kg; PEG 400:30.2gm/kg; PEG 600: 30gm/kg; PEG 1000: 32gm/kg; PEG 1450: > 4gm/kg; PEG 4000: 50gm/kg; PEG 6000: > 50gm/kg; PEG 20000: 31.6gm/kg Polyethylene glycol has been investigated as a mutagen; PEG 1000 has been investigated as a tumorigen	None	Use chemical safety goggles. Wear protective gloves & clean body-covering clothing. NIOSH aprv'd respirator	Inhalation: No adverse health effects expected from inhalation. (May be a mechanical irritant.) Ingestion: Large doses of the lower molecular weight products may cause gastro-intestinal upset. Keep in tightly closed container, stored in cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids, vapors, liquid); observe all warnings & precautions listed for the product. Accidental release: Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Sect.8.Solid Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools & equipment. Reduce airborne dust & prevent scattering by moistening w/ water. Pick up spill for recovery or disposal & place in a closed container. Liquid Spills: Absorb w/ vermiculite, dry sand, earth or similar material & place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer.
Sorbitol	No	None	None	None	Oral, mouse: LD ₅₀ = 17800 mg/kg; Oral, rat: LD ₅₀ : 15900 mg/kg	None	Goggles, lab coat, proper gloves	<i>Inhalation: No adverse health effects expected from inhalation. Ingestion: Large doses may cause gastro-intestinal upset. Accidental Release Measures: Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools & equipment. Reduce airborne dust & prevent scattering by moistening w/ water. Pick up spill for recovery or disposal & place in a closed container. Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings & precautions listed for the product.</i>
<u>Composition /</u>	<u>National</u>	<u>ACGIH</u>	<u>IARC</u>	<u>NIOSH</u>	<u>Carcinogenicity /</u>	<u>OSHA mg/m³</u>	<u>Suggested</u>	<u>Notes; (e.g., Disposal/</u>

Table A-1 (continued) – Roll-up of Toxicology Information, ACGIH-Compiled TLV Information, and Environmental, Safety and Occupational Health (ESOH) Information for Ingredients Contained in Paintballs Used During TBRL Experiments

<u>Constituents</u>	Toxicology Program (NTP)	Threshold Exposure limits/OEL (8-Hour TWA)	Threshold Exposure limits	Threshold Exposure Limits/TWA	Animal Studies, & Incompatibilities	Threshold Exposure limits /PEL Carcinogen* & Note(s) on Flammability	PPE	Transportation DOT/International Considerations) Health Hazards: Exposure Routes (ER), symptoms (SY), target organs (TO)
Glycerine	No	10 mg/m ³ TWA	None	None	Draize test, rabbit, eye: 126 mg Mild; Draize test, rabbit, eye: 500 mg/24H Mild; Draize test, rabbit, skin: 500 mg/24H Mild; Inhalation, rat: LC ₅₀ = >570 mg/m ³ /1H; Oral, mouse: LD ₅₀ = 4090 mg/kg; Oral, rabbit: LD ₅₀ = 27 gm/kg; Oral, rat: LD ₅₀ = 12600 mg/kg; Skin, rabbit: LD ₅₀ = >10 gm/kg	15 mg/m ³ TWA (total); 5 mg/m ³ TWA (respirable fraction)	Wear appropriate protective eyeglasses or chemical safety goggles protective gloves & clothes to prevent skin exposure. NIOSH approved respirator	Eye: May cause eye irritation. Skin: May cause skin irritation. Low hazard for usual industrial handling. Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling. May cause headache. Inhalation: Low hazard for usual industrial handling. Inhalation of a mist of this material may cause respiratory tract irritation. Spills/Leaks: Absorb spill w/ inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers & ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation. Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.
Glycerol	No	10 mg/m ³	None	None	Oral rat LD ₅₀ : 12,600 mg/kg. Investigated as a mutagen, reproductive effector.	15 mg/m ³ (TWA); Respirable Fraction: 5 mg/m ³ (TWA).	Wear appropriate protective eyeglasses or chemical safety goggles protective gloves & clothes to prevent skin exposure. NIOSH approved respirator	<i>Inhalation may cause irritation of respiratory tract. Ingestion: Low toxicity. May cause nausea, headache, diarrhea. Skin Contact: May cause irritation. Eye Contact: May cause irritation. Chronic Exp: May cause kidney injury. Accidental Release Measures: Ventilate area of leak/ spill. Wear appropriate personal protective equipment as specified in Sect 8. Contain & recover liquid when possible. Collect liquid in an appropriate container or absorb w/ an inert material (e. g., vermiculite, dry sand, earth), & place in a chemical waste container. Do not use combustible materials, like saw dust. Do not flush to sewer! Handling & Storage Keep in tightly closed container, stored in cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings & precautions listed for the product.</i>

APPENDIX B

Acronyms

ACRONYMS

A

AAQS	Ambient Air Quality Standards
ACGIH	American Conference of Governmental Industrial Hygienists
AR	Army Regulation

B

C

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHPPM	US Army Center for Health Promotion and Preventive Medicine
CNS	Central Nervous System
CVS	Cardiovascular System

D

D&ETD	Demilitarization & Environmental Technology Division
DoD	Department of Defense
DPW	Department of Public Works
DTP	Detailed Test Plan

E

EA	Environmental Assessment
EASB	Environmental Acquisition Support Branch
ECBC	Edgewood Chemical Biological Center
EIS	Environmental Impact Statement
EMS	Emergency Medical System
EPA	Environmental Protection Agency
ES	Executive Summary
ESOH	Environment, Safety and Occupational Health
EWMTD	Energetics, Warheads and Manufacturing Directorate

F

FNSI	Finding of No Significant Impact
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G

ACRONYMS (continued)

H

HAZMAT Hazardous Material
HRPP Human Resource Protection Plan

I

IMS Intelligent Munitions Systems
IRB Institutional Review Board

J

K

L

LRAD Long Range Acoustic Device
LRT Lower Respiratory Tract
LSRB Laser Safety Review Board

M

MMAD Mass Median Aerodynamic Diameter
MRAD Medium Range Acoustic Device

N

NAAQS National Ambient Air Quality Standards
ND Not Detected
NEPA National Environmental Policy Act
NJDEP New Jersey Department of Environmental Protection
NOHD Nominal Ocular Hazard Distance
NOI Notice of Intent
NOSD Nominal Skin Hazard Distance

O

OSHA Occupational Safety and Health Administration

P

PEL Permissible Exposure Limit
PM_{2.5} Particulate Matter of 2.5 Microns or Less
PM₁₀ Particulate Matter of 10 Microns or Less
ppb Parts Per Billion
ppm Parts Per Million

ACRONYMS (continued)

Q

QE&SA Quality Engineering & System Assurance Directorate

R

RDECOM-ARDEC Research, Development and Engineering Command - Armament
Research, Development and Engineering Center

S

SAR Safety Assessment Report
SOP Standard Operating Procedure
STEL Short Term Exposure Limit
SWAT Special Weapons and Tactics

T

TBRL Target Behavioral Response Laboratory
TPY Tons Per Year
TWA Time Weighted Average

U

URT Upper Respiratory Tract
USC United States Code

V

W

X

Y

Z

FINDING OF NO SIGNIFICANT IMPACT

1. Project Identification: Phase 2 Outdoor Testing By The Target Behavioral Response Laboratory (TBRL) at the 3500 Area and 3800 Area (Tarmac Only) of RDECOM-ARDEC, Picatinny Arsenal.

2. Description of Proposed Action:

TBRL has been tasked to conduct outdoor behavioral response tests to assess the behavioral response of test subjects to various audible, visual and projectile stimuli (including no stimuli as a control), during which the test subjects perform physical activities while being subjected to stimuli as described in the next to last paragraph on this page.

The test subject activities under evaluation include the following activities where the test subjects: (1), are subjected to paintball projectile impact while test subject range of motion is restricted by being held in body restraints; (2), conduct mock aggressive actions against vehicular targets while the vehicles are in motion; (3), conduct goal-oriented physical activities on foot while negotiating a pre-positioned test layout; and (4), perform task-oriented driving maneuvers while approaching a mock vehicle control point.

None of the evaluations will take place in areas determined to be sensitive (i.e., defined as all surface water, wetlands and wetland/stream buffers are shown in the Picatinny Arsenal Real Property Master Plan, Figure 5-2 Natural Constraints) (Reference 2).

These tasks are required by the Army, and will be, and have been, conducted by the TBRL of the Quality Engineering and System Assurance Directorate (QE&SA), at indoor locations and outdoor locations at the 3500 Area, and also indoor and outdoor locations on the tarmac only, in the 3800 Area, of RDECOM-ARDEC.

For the aforementioned tests, the audible stimuli will be provided by sound generating devices (e.g., Medium Range Acoustic Device (MRAD), Long Range Acoustic Device (LRAD), and a Pipebomb Improvised Explosive Device (IED) Trainer to be used indoors only). The visual stimuli will be provided by equipment including laser, flash, and broadband light generation equipment. Projectile stimuli will be provided only by paintballs fired at test subjects equipped with personnel protective equipment (e.g., eye protection, body protection, groin protection, and test subject-operated remote "Stop Test" switches).

The underlying need for the proposed action is to enhance the Soldiers' and Homeland Security Forces' performance and survivability by ensuring knowledge of threat assessment under stress, as provided by light generation equipment, sound generation devices, and projectile (i.e., paintball) stimuli; in cargo convoy operation scenarios, task-oriented driving scenarios, and mock tactical checkpoint operational scenarios.

3. Discussion of Anticipated Environmental Effects:

This Environmental Assessment (EA) was written for staffing for a series of outdoor experiments TBRL has been tasked to perform

Affected environments will be air, ground and water at the Target Behavioral Response Laboratory facilities located at the 3500 area and 3800 Area (tarmac only) of RDECOM-ARDEC, Picatinny Arsenal, NJ.

a. The impact on air quality from conducting the outdoor behavioral response testing will be insignificant, and will be limited to emissions from gasoline powered and diesel powered vehicles and generators. There are no airborne releases from function of energetic materials during the Phase 2 outdoor experiments at the TBRL, since all projectile stimuli (i.e., paintballs), are or will be fired from weapons powered by compressed carbon dioxide. There will also be no releases of regulated constituents subject to levels set forth by the American Conference of Governmental Industrial Hygienists.

b. Water quality is not expected to be significantly impacted by the outdoor behavioral response testing. The release of paintball by-products onto the ground will all take place either on the tarmac only at the 3800 Area, or nonsensitive locations only at the 3500 Area. All paintball by-products are known to be relatively environmentally benign and biodegradable, and include food grade emulsifiers, cosmetic grade additives, food grade dyes, and industrial grade pigments. It is noted that all ingredients in the paintballs are relatively nontoxic, with Oral Rat LD₅₀ data ranging from 4.09 grams/kilogram body weight for glycerine to upwards of 50 grams/kilogram body weight or more for certain polyethylene glycols. Moreover, there is a documented mandated procedure for daily clean-up of paintball residue in place, and set forth in the Building 3518 Stormwater Control Plan. In comparison, similar LD₅₀ data for table salt (e.g., sodium chloride) of 3.0 grams/kilogram body weight has been published. It is therefore unlikely that any significant quantity of paintball by-products will leach into underground and pollute ground water aquifers.

c. No hazardous metallic materials (e.g., heavy metals such as lead, chromium, nickel, and tungsten) are contained in paintballs used by TBRL during the Phase 2 outdoor experiments.

d. Noise levels will be consistent with site specific requirements of the TBRL testing facilities. They will pose no threat to the quality of the environment, and based on investigation of adverse effects on endangered bat species (including the Indiana Bat) from similar and louder noise profiles from high caliber weapons fire at another Army installation, are not expected to adversely affect Indiana Bat populations or behavior. The health of test subjects and test operating personnel will be ensured by adherence to procedures established for the operation of light generation equipment, sound generation equipment, and paintball guns, including the wearing of appropriate hearing protection.

4. Conclusions:

Based on preparation of this EA, the proposed outdoor TBRL testing and experimentation will not significantly impact the environment. The following determinations for this program are noted:

- a. It is not an action that will significantly affect the quality of the human environment.
- b. It will not have a significant impact on the environment.
- c. It is not likely to be environmentally controversial.
- d. It does not require an environmental impact statement.

5. Point of Contact (POC) for Public Comments:

Commander
U.S. Armament Research, Development and Engineering Center (ARDEC),
Public Affairs Office
ATTN: Mr. Pete Rowland, RDAR-AO
Bldg. 319
Picatinny Arsenal, NJ 07806-5000

6. Public Comment Period:

Comments regarding these findings should be forwarded to the POC within thirty (30) days of public notification.