VERTICAL GUN TEST
ENVIRONMENTAL ASSESSMENT

MISSILE DEFENSE AGENCY

AGENCY: Missile Defense Agency (MDA)

ACTION: Finding of No Significant Impact

BACKGROUND: The Missile Defense Agency (MDA) prepared an Environmental Assessment (EA) to evaluate the potential environmental consequences of using thickened tributyl phosphate (TBP) as a chemical agent simulant in a maximum of six vertical gun experiments to be conducted at the Energetic Materials Research and Testing Center (EMRTC) at the New Mexico Institute of Mining and Technology (NMT), located near Socorro, New Mexico. Canisters containing dye enhanced, thickened TBP would be launched vertically at speeds approaching Mach 3 or 4 from the 3K North site and dispersed to assist MDA in determining drop size distribution for a simulated chemical agent threat. Aerosol and droplet debris would be primarily monitored using passive sensors. The TBP experiments would improve MDA's ability to evaluate ground hazards from the intercept of a threat warhead bearing chemical payloads.

After reviewing and analyzing currently available data and information on existing conditions, project impacts, and measures to mitigate those impacts, the MDA has determined that the proposed action is not a Federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969, as amended. Therefore, the preparation of an Environmental Impact Statement (EIS) would not be required and MDA is issuing a Finding of No Significant Impact. The MDA made this determination in accordance with all applicable environmental laws.

The EA was prepared in accordance with NEPA; the Council on Environmental Quality regulations that implement NEPA (Code of Federal Regulations [CFR], Title 40, Parts 1500-1508); Department of Defense Instruction 4715.9, *Environmental Planning and Analysis*; and the applicable service regulations that implement these laws and regulations.

DESCRIPTION OF THE PROPOSED ACTION: Droplet size distribution has been identified by MDA as the most important factor in determining ground hazard estimations from chemical payloads. Therefore, the purpose of the proposed action is to provide MDA with test scenarios where the drop size and dispersion of simulated threat agents can be monitored, and thus enhance MDA's ground hazard estimation modeling capability. The data collected from these tests would be used to validate MDA's Post-Engagement Ground Effects Model (PEGEM).

MDA proposes to conduct up to six vertical gun tests within a two-week period at the NMT 3K North site. Canisters containing TBP would be launched at the 3K North site. Tests would occur during the summer months when wind speeds are low and any rain deposited on the ground quickly evaporates which would meet the test designers objectives of preventing the TBP from dispersing over a wide area and allow TBP deposited on the ground to rapidly photodegrade. The canisters would contain approximately 50 kilograms (110 pounds) of TBP thickened using polybutyl methacrylate (PBMA) enhanced with blue dye for observation purposes. A small amount of explosives would be used to rupture the canister tanks during ascent at an altitude of approximately 500 meters (1,640 feet), resulting in the creation of a short-lived aerosol debris cloud and the subsequent dispersion of TBP droplets. TBP droplets would be monitored using several remote-sensing methods including:

- High-speed cameras placed at different locations at the test site would provide a visual documentary.
- Doppler radar would be used to monitor velocity of the canister during the tests.
- Lidar would be used to characterize the drop formation process, with Ka-Band radar and W-Band radar used to monitor drop size.

Approximately twelve witness cards designed to receive the dye enhanced TBP would also be placed on the ground approximately one to two hours prior to the test, with their location determined by modeling based on the current prevailing wind conditions.

The test planners have determined that weather related criteria would be established to determine Go/No-Go test conditions. The test planners determined a worst-case scenario based on PEGEM. The model predicted when winds from the west (blowing between 270 to 315 degrees) were less than or equal to 13 kilometers per hour (8 miles per hour), the test objectives could not be met and the tests would not be conducted. Test planners indicated that realistically given normal meteorological conditions the proposed tests would be conducted when winds are less than 3 miles per hour (4.83 kilometers per hour). At this wind speed, TBP dispersion is anticipated to remain within the immediate vicinity of the 3K North site.

ALTERNATIVES TO THE PROPOSED ACTION: While alternatives to the proposed action were initially considered during formulation of the test plan, these alternatives were considered infeasible because they would not adequately meet MDA's objective to determine drop size distribution for a simulated chemical agent threat. The use of simulants other than TBP was considered, specifically the use of Bis (2-ethylhexyl) phosphonate and triethyl phosphate. Using either of

these two substances would not achieve the test objectives of realistically simulating the threat. In addition, although parathion and malathion would realistically emulate the threat, they were eliminated from further consideration because of their high toxicity.

The High Performance Magazine site at EMRTC was considered as an alternate site for the proposed tests. The High Performance Magazine site is located at a relatively high altitude. This altitude, in conjunction with fewer mountains surrounding the site results in increased wind velocities. Thus, conducting the proposed vertical tests at the High Performance Magazine site would result in the potential for TBP to be dispersed over a greater land mass area, and to reach a greater height in the atmosphere than test planning intended. These factors would severely affect meeting test objectives; therefore, the High Performance Magazine site was dismissed from further evaluation.

ENVIRONMENTAL EFFECTS:

Methodology

Thirteen resource areas were considered to provide a context for understanding the potential effects of the proposed action and to provide a basis for assessing the severity of potential impacts, with attention focused on key issues. The resource areas considered included: air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and hazardous waste, health and safety, land use, noise, socioeconomics and environmental justice, transportation and infrastructure, visual resources, and water resources.

The Region of Influence was determined for each resource area discussed in this EA. The Region of Influence describes a unique region for each resource area that represents the area with the potential to be affected by the proposed action. The environmental consequences associated with the proposed action and no action alternatives were analyzed for each Region of Influence within the context of resource areas.

Proposed Action

A detailed impacts analysis was conducted for all resource areas. No significant impacts to airspace, cultural resources, health and safety, land use, socioeconomics and environmental justice, transportation and infrastructure, or visual resources would occur from up to six proposed tests at the 3K North site. No significant impacts would result from hazardous materials or hazardous waste used or produced as a result of the proposed action. Applicable regulations and operating procedures would be followed when handling hazardous materials and waste. The following describes the results for those resource areas that presented a potential for impact.

Construction activities and equipment, propellant from the gun, and generators would produce air emissions; however, no significant impacts would be expected. PBMA and the dye are inert; therefore, no significant air quality impacts would be expected from their use. Given the rapid dispersion of the droplets and the facility's remote location, no long-term air quality impacts would be expected. In a failed test, the canister would fall and rupture upon impact with the ground. The primary receiving environment would be soils, and there would be no significant air quality impacts.

It is unlikely that noise would elicit startle responses in wildlife. Biological resources near the 3K North site would not be exposed to concentrations of TBP over 100 milligrams per square meter. PEGEM indicates concentrations of TBP would not approach toxic levels for birds. The use of spill prevention measures would reduce or eliminate potential impacts to biological resources. There would be no effects to endangered, threatened, or proposed species, New Mexico Species of Concern, or designated or proposed critical habitat as a result of this proposed action.

TBP droplets landing on the ground would photodegrade within a few hours when exposed to sunlight. The dye would also break down rapidly; however, some dye may be visible for up to a few months. If TBP were deposited in one spot (due to a spill or failed test), clean up would be conducted using existing procedures. Therefore, no significant impact to geology and soils would be expected.

Noise from generators would not be heard in the community of Socorro. The primary noise would be from firing the gun, which would be similar to jet flyovers. Socorro would be buffered from noise by the mountains and would not be affected. A test failure would not alter noise levels. Therefore, no significant noise impacts would be expected.

PEGEM indicates that TBP concentrations at a local spring would be 1 to 10 milligrams per square meter, which would be unlikely to significantly impact water quality. Given the amount of TBP and its likelihood to photodegrade in sunlight, no significant impacts would be expected. In a test failure or spill, TBP would impacts soils; however, because of spill prevention and cleanup protocols, soil impermeability, and the depth to ground water, no significant ground water impacts would be expected.

Cumulative Impacts

According to 40 CFR § 1508.7, cumulative impacts can be defined as "...the incremental impact of the actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions."

For this analysis, cumulative impacts include impacts from the proposed tests and reasonably foreseeable tests at EMRTC. No significant cumulative impacts to airspace, cultural resources, land use, socioeconomics and environmental justice, transportation and infrastructure, or visual resources would occur from the combined impact of existing testing operations and the up to six proposed tests at the 3K North site.

Because TBP would photodegrade and decompose, no significant cumulative impacts would be expected to air quality, biological resources, geology and soils, and water resources. In addition, all applicable standard operating procedures for health and safety and for handling hazardous materials and waste would be followed; therefore, no significant cumulative impacts would be expected.

No Action Alternative

Under the no action alternative, the proposed tests using TBP would not occur from the 3K North site. Other unrelated tests at EMRTC would continue to occur and would have the potential to impact the environment. There would be no significant impacts to air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and hazardous waste, land use, noise, transportation and infrastructure, visual resources, and water resources.

Under the no action alternative, there would be no proposed tests using TBP; and therefore, none of the potential impacts to health and safety would occur. The purpose of the proposed action is to allow MDA to better predict the dispersion of simulated chemical weapon threats that could compromise public health and safety. Without data obtained from the proposed tests using TBP as a threat simulant, MDA would be unable to verify necessary data and would be forced to rely on data produced from computer-based simulation rather than field-tested observations.

Under the no action alternative, no proposed testing would occur at the 3K North site, and it is unlikely that the vertical gun would be developed or used for future tests. Revenue generated by research, testing, and training activities at EMRTC supply a large portion of the income for the community of Socorro. Local hotels and restaurants benefit substantially from the number of scientists, researchers, and individuals receiving training at the facility that visit the community annually. Although the no action alternative would not affect employment trends in the region, it would place limitations on the current and future test capabilities of EMRTC. This phenomenon could inadvertently result in adverse economic effects for the community.

PUBLIC COMMENT: The EA and Draft Finding of No Significant Impact were released for public review and comment. The MDA established a toll free fax line, e-mail address, and U.S. postal service mailbox to receive comments. Three comments were received. Two of the comments were determined to be outside the scope of this project and one comment requested additional information about the availability of the documents from the MDA public web site. None of the comments resulted in revisions to the EA or Finding of No Significant Impact.

CONCLUSION: An analysis of the proposed action has concluded that there are no significant short-term or long-term effects to the environment or surrounding populations. After careful and thorough consideration of the facts herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives set forth in Section 101(a) of NEPA and that it will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102 (2) (c) of NEPA. Therefore, an EIS for the proposed action is not required.

DEADLINE FOR RECEIPT OF WRITTEN COMMENTS: 18 May 2004

POINT OF CONTACT: Submit written comments or requests for a copy of the Vertical Gun Test EA to: Vertical Gun EA, c/o ICF Consulting, 9300 Lee Highway, Fairfax, VA 22031; via toll-free fax 1-877-851-5451; or via E-mail verticalgun.ea@icfconsulting.com.

VERTICAL GUN TEST

ENVIRONMENTAL ASSESSMENT

AGENCY: Missile Defense Agency (MDA)

ACTION: Finding of No Significant Impact

PROPONENT:

DATE: 19 May 04

DR. CHARLES A. LIND
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Modeling and Simulation Program

APPROVED:

DATE: 21 May 04

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