| Exhibit R-2, PB 2010 Army RDT&E Budget Item Justification | | | | | | | | DATE: May 2009 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>2040 - Research, Development, Test & Evaluation, Army/BA 2 - Applied Research | | | | | R-1 ITEM NOMENCLATURE<br>PE 0602622A Chemical, Smoke and Equipment Defeating Technology | | | | | |
| **COST ($ in Millions)** | **FY 2008 Actual** | **FY 2009 Estimate** | **FY 2010 Estimate** | **FY 2011 Estimate** | **FY 2012 Estimate** | **FY 2013 Estimate** | **FY 2014 Estimate** | **FY 2015 Estimate** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 10.248 | 8.906 | 5.293 | | | | | | Continuing | Continuing |
| BA1: Protection Technologies (CA) | 8.061 | 6.618 | .000 | | | | | | Continuing | Continuing |
| 552: SMOKE/NOVEL EFFECT MUN | 2.187 | 2.288 | 5.293 | | | | | | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The objective of this program element (PE) is to investigate and evaluate obscurant technologies to increase personnel and platform survivability and develop and validate forensic analysis methods for military and homemade explosive devices, including their precursors and residue. This PE pursues research in materials science and dissemination methodologies and mechanisms and technologies and techniques to enable forensic analysis of explosive signatures (project 552).

Work in this PE is related to, and fully coordinated with, PE 0603004A/project L97 (Smoke and Obscurants Advanced Technology) and PE 0603606A/project 608 (Countermine & Barrier Development).

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

This work is performed by the Army Research, Development, and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

| Exhibit R-2, PB 2010 Army RDT&E Budget Item Justification | DATE: May 2009 |
|---|---|
| **APPROPRIATION/BUDGET ACTIVITY**<br>2040 - Research, Development, Test & Evaluation, Army/BA 2 - Applied Research | **R-1 ITEM NOMENCLATURE**<br>PE 0602622A Chemical, Smoke and Equipment Defeating Technology |

**B. Program Change Summary ($ in Millions)**

| | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|
| Previous President's Budget | 8.976 | 2.295 | 2.324 | |
| Current BES/President's Budget | 10.248 | 8.906 | 5.293 | |
| Total Adjustments | 1.272 | 6.611 | 2.969 | |
| Congressional Program Reductions | .000 | -.029 | | |
| Congressional Rescissions | .000 | .000 | | |
| Total Congressional Increases | .000 | 6.640 | | |
| Total Reprogrammings | 1.495 | .000 | | |
| SBIR/STTR Transfer | -.223 | .000 | | |

**Change Summary Explanation**

FY08 funding increased due to transfer from Navy 1490 for Sensor Arrays for Multiple Applications (SAMA).

FY09 funding increases are due to congressional adds.

FY10 funding increased to support Forensic Analysis of Explosive Signatures.

| Exhibit R-2a, PB 2010 Army RDT&E Project Justification | | | | | | | | DATE: May 2009 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>2040 - Research, Development, Test & Evaluation, Army/BA 2 - Applied Research | | | | R-1 ITEM NOMENCLATURE<br>PE 0602622A Chemical, Smoke and Equipment Defeating Technology | | | | | PROJECT NUMBER<br>BA1 | |
| **COST ($ in Millions)** | **FY 2008 Actual** | **FY 2009 Estimate** | **FY 2010 Estimate** | **FY 2011 Estimate** | **FY 2012 Estimate** | **FY 2013 Estimate** | **FY 2014 Estimate** | **FY 2015 Estimate** | **Cost To Complete** | **Total Cost** |
| BA1: Protection Technologies (CA) | 8.061 | 6.618 | .000 | | | | | | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

Congressional Interest Item funding for Protection Technologies applied research.

| B. Accomplishments/Planned Program ($ in Millions) | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|
| Systems Biology Biomarker Molecular Toxicology Initiative | 1.546 | 2.557 | .000 | |
| Rapid and Accurate Pathogen Identificatlon/Detection (RAPID) Program | 1.159 | 1.550 | .000 | |
| Paint Shield for Protecting People from Microbial Threats | 1.546 | .000 | .000 | |
| Enhanced Vapor Aeration Capabilities (EVAC) | 2.319 | 2.325 | .000 | |
| Sensor Arrays for Multiple Applications (SAMA) | 1.491 | .000 | .000 | |
| SBIR/STTR | .000 | .186 | .000 | |
| Total | 8.061 | 6.618 | .000 | |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

| Exhibit R-2a, PB 2010 Army RDT&E Project Justification | | | | | | | | DATE: May 2009 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>2040 - Research, Development, Test & Evaluation, Army/BA 2 - Applied Research | | | | R-1 ITEM NOMENCLATURE<br>PE 0602622A Chemical, Smoke and Equipment Defeating Technology | | | | | PROJECT NUMBER<br>552 | |
| **COST ($ in Millions)** | **FY 2008 Actual** | **FY 2009 Estimate** | **FY 2010 Estimate** | **FY 2011 Estimate** | **FY 2012 Estimate** | **FY 2013 Estimate** | **FY 2014 Estimate** | **FY 2015 Estimate** | **Cost To Complete** | **Total Cost** |
| 552: SMOKE/NOVEL EFFECT MUN | 2.187 | 2.288 | 5.293 | | | | | | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The project investigates and evaluates obscurant technologies that degrade threat force surveillance sensors and defeat the enemy's target acquisition devices, missile guidance, and directed energy weapons. This project investigates advanced infra-red (IR) and multi-spectral obscurant materials that provide effective, affordable, and efficient screening of deployed forces, while being safe and environmentally acceptable. Additionally, it researches and investigates forensic analysis technology in explosives and explosives-related chemical signatures, and develops and validates field sampling and forensics methods for use in a forward-deployed laboratory.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Army Research, Development, and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

| B. Accomplishments/Planned Program ($ in Millions) | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|
| Obscurant Enabling Technology: This effort investigates distribution technologies for various obscurants.<br><br>In FY08, conducted studies to examine performance improvements in low toxicity visual obscurant and new bi-spectral obscurants.<br><br>In FY09, conduct studies of dissemination techniques for low toxicity bi-spectral obscurants and new bi-spectral obscurants.<br><br>In FY10, will conduct modeling and chamber evaluation studies to examine performance improvements possible for microwave obscurants. | .925 | .875 | .885 | |
| Small Business Innovative Research/Small Business Technology Transfer Programs | .000 | .032 | .000 | |
| Advanced Obscurants: This effort investigates technologies which enable safe, effective screening of personnel and equipment. | 1.262 | 1.381 | 1.426 | |

| Exhibit R-2a, PB 2010 Army RDT&E Project Justification | | DATE: May 2009 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>2040 - Research, Development, Test & Evaluation, Army/BA 2 - Applied Research | R-1 ITEM NOMENCLATURE<br>PE 0602622A Chemical, Smoke and Equipment Defeating Technology | PROJECT NUMBER<br>552 |

| B. Accomplishments/Planned Program ($ in Millions) | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|
| In FY08, performed modeling and simulation to determine the survivability increase achieved over current smoke systems; and conducted a technology evaluation of selected prototype grenade.<br><br>In FY09, expand existing theory for advanced obscurants across the entire spectrum of interest (visual, IR and microwave regions); examine alternate theoretical approaches; determine particle characteristics based upon theory; and initiate investigation of new high performing, low toxicity visual obscurants. Conduct studies of bi-spectral (visual thru Far IR) obscurant concepts.<br><br>In FY10, will investigate, through chamber and field evaluation, bi-spectral packaging and dissemination concepts to improve overall obscuration performance. | | | | |
| Forensic Analysis of Explosive Signatures: This effort investigates the detection and analysis of chemical and biological explosive material signatures.<br>In FY10, will conduct surface/vapor characterization of existing high explosives (HEs); and common materials used in homemade explosives (HMEs); will conduct environmental persistence studies (how long a compound is available) relevant to counter HE and HME sensing operations; will also conduct fate and transport studies for post blast event surface chemical residues, and will identify chemical compounds present in decomposition pathways (those that are the result of thermal or photochemical degradation). | .000 | .000 | 2.982 | |
| Total | 2.187 | 2.288 | 5.293 | |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.