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**Exhibit R-2, PB 2010 Office of Secretary Of Defense RDT&E Budget Item Justification** **DATE:** May 2009

| <b>APPROPRIATION/BUDGET ACTIVITY</b>   |                       |                         |                         |                         | <b>R-1 ITEM NOMENCLATURE</b>   |                         |                         |                         |                         |                   |
|--|-----------------------|-------------------------|-------------------------|-------------------------|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------|
| 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 3 - Advanced Technology Development (ATD) |                       |                         |                         |                         | PE 0603716D8Z Strategic Environmental Research and Development Program (SERDP) |                         |                         |                         |                         |                   |
| <b>COST (\$ in Millions)</b>   | <b>FY 2008 Actual</b> | <b>FY 2009 Estimate</b> | <b>FY 2010 Estimate</b> | <b>FY 2011 Estimate</b> | <b>FY 2012 Estimate</b>  | <b>FY 2013 Estimate</b> | <b>FY 2014 Estimate</b> | <b>FY 2015 Estimate</b> | <b>Cost To Complete</b> | <b>Total Cost</b> |
| Total Program Element  | 65.780                | 68.659                  | 69.175                  |                         |  |                         |                         |                         | Continuing              | Continuing        |
| P470: Strategic Environmental Research and Development Program (SERDP)                                     | 65.780                | 68.659                  | 69.175                  |                         |  |                         |                         |                         | Continuing              | Continuing        |

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

Congress established the Strategic Environmental Research and Development Program (SERDP) in 1990 (10 U.S.C. Section 2901-2904) to address Department of Defense (DoD) and Department of Energy (DOE) environmental concerns. It is conducted as a DoD program, jointly planned and executed by the DoD, DOE, and the Environmental Protection Agency (EPA), with strong participation by other Federal agencies, industry, and academia. SERDP's objective is to improve DoD mission readiness and environmental performance by providing new scientific knowledge and cost-effective technologies in the areas of Environmental Restoration, Munitions Management, Sustainable Infrastructure, and Weapons Systems and Platforms. SERDP does this by addressing high priority DoD environmental technology requirements. SERDP enhances military operations, improves military systems' effectiveness, enhances military training/readiness, sustains DoD's training and test ranges and installation infrastructure, and helps ensure the safety and welfare of military personnel and their dependents by eliminating or reducing the generation of pollution and use of hazardous materials and reducing the cost of remedial actions and compliance with environmental laws and regulations. As a secondary benefit, SERDP helps solve significant national and international environmental problems. The keys to a growing list of SERDP technological successes are the ability to respond aggressively and proactively to priority defense environmental needs; the pursuit of world-class technical excellence; and an emphasis on constant technology transfer.

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| <b>APPROPRIATION/BUDGET ACTIVITY</b>   | <b>R-1 ITEM NOMENCLATURE</b>   |
| 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 3 - Advanced Technology Development (ATD) | PE 0603716D8Z Strategic Environmental Research and Development Program (SERDP) |

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

|   | <u>FY 2008</u> | <u>FY 2009</u> | <u>FY 2010</u> | <u>FY 2011</u> |
|---|----------------|----------------|----------------|----------------|
| Previous President's Budget   | 69.071         | 69.038         | 70.438         |                |
| Current BES/President's Budget  | 65.780         | 68.659         | 69.175         |                |
| Total Adjustments   | -3.291         | -0.379         | -1.263         |                |
| Congressional Program Reductions  |                |                |                |                |
| Congressional Rescissions   |                | -0.379         |                |                |
| Total Congressional Increases   |                |                |                |                |
| Total Reprogrammings  | -1.780         |                |                |                |
| SBIR/STTR Transfer  | -1.373         |                |                |                |
| Internal realignment of funds to meet DDR&E priorities                        | -0.138         |                |                |                |
| Balance attributed to undistributed reductions levied by legislative policies |                |                | -0.352         |                |
| Other   |                |                | -0.911         |                |

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| <b>Exhibit R-2a, PB 2010 Office of Secretary Of Defense RDT&amp;E Project Justification</b>   |                           |                             |                             |   |                             |                             |                             | <b>DATE:</b> May 2009       |                               |                   |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>0400 - Research, Development, Test & Evaluation, Defense-Wide/BA<br>3 - Advanced Technology Development (ATD) |                           |                             |                             | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0603716D8Z Strategic Environmental Research and<br>Development Program (SERDP) |                             |                             |                             |                             | <b>PROJECT NUMBER</b><br>P470 |                   |
| <b>COST (\$ in Millions)</b>  | <b>FY 2008<br/>Actual</b> | <b>FY 2009<br/>Estimate</b> | <b>FY 2010<br/>Estimate</b> | <b>FY 2011<br/>Estimate</b>   | <b>FY 2012<br/>Estimate</b> | <b>FY 2013<br/>Estimate</b> | <b>FY 2014<br/>Estimate</b> | <b>FY 2015<br/>Estimate</b> | <b>Cost To<br/>Complete</b>   | <b>Total Cost</b> |
| P470: Strategic<br>Environmental Research<br>and Development Program<br>(SERDP)   | 65.780                    | 68.659                      | 69.175                      |   |                             |                             |                             |                             | Continuing                    | Continuing        |

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

Congress established the Strategic Environmental Research and Development Program (SERDP) in 1990 (10 U.S.C. Section 2901-2904) to address Department of Defense (DoD) and Department of Energy (DOE) environmental concerns. It is conducted as a DoD program, jointly planned and executed by the DoD, DOE, and the Environmental Protection Agency (EPA), with strong participation by other Federal agencies, industry, and academia. SERDP's objective is to improve DoD mission readiness and environmental performance by providing new scientific knowledge and cost-effective technologies in the areas of Environmental Restoration, Munitions Management, Sustainable Infrastructure, and Weapons Systems and Platforms. SERDP does this by addressing high priority DoD environmental technology requirements. SERDP enhances military operations, improves military systems` effectiveness, enhances military training/readiness, sustains DoD's training and test ranges and installation infrastructure, and helps ensure the safety and welfare of military personnel and their dependents by eliminating or reducing the generation of pollution and use of hazardous materials and reducing the cost of remedial actions and compliance with environmental laws and regulations. As a secondary benefit, SERDP helps solve significant national and international environmental problems. The keys to a growing list of SERDP technological successes are the ability to respond aggressively and proactively to priority defense environmental needs; the pursuit of world-class technical excellence; and an emphasis on constant technology transfer.

**B. Accomplishments/Planned Program (\$ in Millions)**

|  | <b>FY 2008</b> | <b>FY 2009</b> | <b>FY 2010</b> | <b>FY 2011</b> |
|--|----------------|----------------|----------------|----------------|
| Environmental Restoration  | 20.648         | 20.149         | 18.687         |                |
| Environmental Restoration (ER) reduces DoD's liabilities by developing technologies for the cost-effective detection, characterization, containment, and remediation of contamination in soil, sediments, and water.   |                |                |                |                |
| <i>FY 2008 Accomplishments:</i><br>Science and technology advancements were made to address DoD's emerging groundwater issues, sediment contamination, sustainment of test and training ranges, managing persistent DoD contamination, and improve the monitoring and optimization of DoD remediation efforts. New investments were initiated to advance our understanding of explosive biodegradation, reduce the cost of |                |                |                |                |

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| <b>Exhibit R-2a, PB 2010 Office of Secretary Of Defense RDT&amp;E Project Justification</b>  |   |                | <b>DATE:</b> May 2009         |                |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>0400 - Research, Development, Test & Evaluation, Defense-Wide/BA<br>3 - Advanced Technology Development (ATD)  | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0603716D8Z Strategic Environmental Research and<br>Development Program (SERDP) |                | <b>PROJECT NUMBER</b><br>P470 |                |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>   | <b>FY 2008</b>  | <b>FY 2009</b> | <b>FY 2010</b>                | <b>FY 2011</b> |
| <p>long term monitoring, and understand the impacts of contaminated source zones on groundwater plumes. A major accomplishment was the development of wildlife toxicity data for munitions compounds. These data allowed DoD managers to make informed risk based decisions and limit the requirement for costly site specific risk assessments. Details on all SERDP ER projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2009 Plans:</i><br/>SERDP will continue to improve scientific understanding and develop innovative cost effective methods in support of DoD's remediation efforts and the sustainment of DoD ranges. New initiatives will address the areas of managing large dilute plumes of contaminated groundwater, improved identification of munitions constituent source zones on DoD ranges, improved understanding of vapor intrusion pathways from chlorinated solvent contaminated groundwater, improved understanding of the fate and transport of munitions constituents, and improved understanding of environmental parameters and sampling methods on measured groundwater contaminant concentrations. A description of all new FY 2009 ER projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2010 Plans:</i><br/>New research initiatives will focus on innovative risk assessment approaches for military unique compounds, the options and limitations for treatment of persistent contaminated groundwater plumes, and bioavailability of contamination found on DoD ranges and sediments. Details are available at <a href="http://www.serdp.org">www.serdp.org</a>.</p> |   |                |                               |                |
| <p><b>Munitions Management (MM)</b></p> <p>Munitions Management (MM) develops detection, discrimination, and remediation technologies for Unexploded Ordnance (UXO) to address the significant DoD liability in the Military Munitions Response Program. Investments are also made to improve active range clearance and reduced generation of UXO during live fire testing and training operations.</p>   | 13.328  | 14.181         | 14.493                        |                |

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| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  | <b>FY 2008</b>  | <b>FY 2009</b> | <b>FY 2010</b>                | <b>FY 2011</b> |
| <p><i>FY 2008 Accomplishments:</i><br/>Investment in munitions management yielded new technologies to address the difficult and persistent issues faced by the Military Munitions Response Program. Technology advancements continued in the areas of ground based detection and discrimination, wide area assessment, detection of underwater UXO, and advanced planning and assessment tools. Investigators continued to use the two standardized test sites for the evaluation of UXO detection technologies and continued efforts to improve sensor designs and improve detection and discrimination methods. A major accomplishment was the successful development of a new micro-fabricated total field magnetometer which will reduce the size, cost, and power required over currently fielded instruments by orders of magnitude. Details on all SERDP MM projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2009 Plans:</i><br/>New initiatives will continue to focus on advanced sensors, signal processing, supporting technologies and protocols. Notably is the development of more capable hand held sensors for detecting and discriminating buried UXO and systems for the detection and discrimination of underwater munitions. In addition, projects will be funded to analyze data obtained from recent live site discrimination tests to improve current algorithms and develop new discrimination approaches. A description of all new FY 2009 MM projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2010 Plans:</i><br/>New research initiatives will focus on advancements in underwater UXO detection and discrimination, advanced sensors, signal processing, supporting technologies, and protocols to reduce the costs associated with detecting and remediating UXO. Details are available at <a href="http://www.serdp.org">www.serdp.org</a>.</p> |   |                |                               |                |
| <p>Sustainable Infrastructure</p> <p>Sustainable Infrastructure (SI) develops the science and technologies required to sustain training and testing ranges and installation infrastructure as well as the base camps required for deployed forces.</p>  | 18.026  | 19.651         | 18.698                        |                |

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| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  | <b>FY 2008</b>  | <b>FY 2009</b> | <b>FY 2010</b>                | <b>FY 2011</b> |
| <p><i>FY 2008 Accomplishments:</i><br/>Science and technology advancements were made to improve DoD's ecosystem based management, protection of threatened and endangered species and marine mammals, management of cultural resources on DoD lands, and protection of watersheds to sustain military test and training lands. Continued investments were made to address issues of noise, air quality, and energy to support the long term cost effective sustainability of military installations. New initiatives included efforts to address critical natural resources issues straining the management of military installations in the pacific islands and the development of advanced technologies to reduce the energy needs of deployed forces. A major accomplishment was the successful development of new techniques for and a spatial decision support systems to predict the location and densities of marine mammals in support of critical Navy operations. New more accurate assessments and forecasts for marine mammal densities will support scientifically based regulatory decisions. Details on all SERDP SI projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2009 Plans:</i><br/>SERDP will continue efforts to address persistent issues that severely impact installation readiness and the ability to support training and testing. New initiatives will develop an understanding of the mechanisms of forest decline on installations in the Southeast, assess the impacts of potential sea level rise on military infrastructure across the United States and climate change on coastal ecosystems on military lands in the southeast, and develop tools to predict the impact of military training activities on archeological resources on DoD lands. A description of all new FY 2009 SI projects can be found at <a href="http://www.serdp.org">www.serdp.org</a></p> <p><i>FY 2010 Plans:</i><br/>New research initiatives will assess the impact of climate change on military lands in the southwest and improve our understanding and develop tools to manage the generation of dust due to military activities on our ranges. Details are available at <a href="http://www.serdp.org">www.serdp.org</a>.</p> |   |                |                               |                |
| Weapons Systems and Platforms   | 13.778  | 14.678         | 17.297                        |                |

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| <p>Weapons Systems and Platforms (WP) develops technologies and materials that reduce the waste and emissions associated with the manufacturing, maintenance, and use of DoD weapons systems and platforms to reduce future environmental liabilities and their associated costs and impacts.</p> <p><i>FY 2008 Accomplishments:</i><br/>Continuing efforts focused on advanced surface engineering and structural materials to eliminate hazardous materials from DoD assets, the assessment and management of noise and emissions from military platforms, development of green alternative munitions and energetics, and the elimination of hazardous waste in the maintenance and management of military systems. New efforts were initiated in the following areas: Environmentally Benign, High-Strength Fasteners for Weapons Systems; Scientific Understanding of Non-Chromated Corrosion Inhibitors Function; Environmentally Benign Pyrotechnics Assemblies; and Understanding Volatile Particle Emissions from Military Aircraft. A significant accomplishment was the development of new techniques to measure the emissions from military gas turbine engines. New high quality emissions data will directly support basing decisions and future engine development. Details on all SERDP WP projects can be found at <a href="http://www.serdp.org">www.serdp.org</a>.</p> <p><i>FY 2009 Plans:</i><br/>The Weapons Systems and Platforms program will continue to focus on development of 'green' energetics, munitions, and weapons systems components as well as innovative life-cycle-based coating systems for military aircraft and land based platforms that eliminates volatile organic compounds, heavy metal constituents, and associated hazardous air pollutants. New efforts will be initiated in advanced methods for removing solid waste from shipboard waste streams, characterization of open burn/open detonation of energetics, environmentally benign aircraft deicing and anti-icing, new techniques to predict corrosion protection, and the science behind military paint strippers. A description of all new FY 2009 WP projects can be found at <a href="http://www.serdp.org">www.serdp.org</a></p> <p><i>FY 2010 Plans:</i><br/>New initiatives are planned to develop alternatives to perchlorate for missile systems, replacement for the military uses of the global warming gas SF6, new military cleaners and paint stripping techniques,</p> |   |                |                               |                |

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| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  | <b>FY 2008</b>  | <b>FY 2009</b> | <b>FY 2010</b>                | <b>FY 2011</b> |
| sustainable materials and processes for military composites, and a scientific understanding of the impacts of lead free electronics in military hardware. Details are available at <a href="http://www.serdp.org">www.serdp.org</a> .   |   |                |                               |                |
| <b>C. Other Program Funding Summary (\$ in Millions)</b><br>N/A   |   |                |                               |                |
| <b>D. Acquisition Strategy</b><br>N/A   |   |                |                               |                |
| <b>E. Performance Metrics</b><br>Performance in this program is monitored at two levels. At the lowest level, each of the more than 160 individual projects is measured against both technical and financial milestones on a quarterly and annual basis. At a program-wide level, progress is measured against DoD's environmental requirements and the development of technologies that address these requirements as well as the transition of these technologies to either to demonstration and validation programs or to direct use in the field. |   |                |                               |                |

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