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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense

DATE: February 2011

**APPROPRIATION/BUDGET ACTIVITY**  
 0400: Research, Development, Test & Evaluation, Defense-Wide  
 BA 3: Advanced Technology Development (ATD)

**R-1 ITEM NOMENCLATURE**  
 PE 0603716D8Z: Strategic Environmental Research and Development Program (SERDP)

COST (\$ in Millions)	FY 2010	FY 2011	FY 2012	FY 2012	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	Cost To	Total Cost
			Base	OCO	Total					Complete	Total Cost
Total Program Element	62.251	68.021	66.409	-	66.409	67.119	68.412	69.868	71.938	Continuing	Continuing
P470: Strategic Environmental Research and Development Program (SERDP)	62.251	68.021	66.409	-	66.409	67.119	68.412	69.868	71.938	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 Response, Resource Conservation and Climate Change, 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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**APPROPRIATION/BUDGET ACTIVITY** R-1 ITEM NOMENCLATURE  
 0400: Research, Development, Test & Evaluation, Defense-Wide PE 0603716D8Z: Strategic Environmental Research and Development Program (SERDP)  
 BA 3: Advanced Technology Development (ATD)

B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	69,175	68,021	68,695	-	68,695
Current President's Budget	62,251	68,021	66,409	-	66,409
Total Adjustments	-6,924	-	-2,286	-	-2,286
• Congressional General Reductions	-	-	-	-	-
• Congressional Directed Reductions	-	-	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-3,199	-	-	-	-
• SBR/STTR Transfer	-1,576	-	-	-	-
• Congressional Directed Reduction	-1,500	-	-	-	-
• Other Program Adjustments	-0,649	-	-1,725	-	-1,725
• Defense Efficiency - Report, Studies, Boards and Commissions	-	-	-0,468	-	-0,468
• Defense Efficiency - Contractor Support Staff	-	-	-	-	-
• Economic Assumptions	-	-	-0,093	-	-0,093

**Change Summary Explanation**

Defense Efficiency – Report, Studies, Boards and Commissions. As part of the Department of Defense reform agenda, reflects a reduction in the number and cost of reports, studies, DoD Boards and DoD Commissions below the aggregate level reported in previous budget submission.  
 Defense Efficiency – Contractor Staff Support. As part of the Department of Defense reform agenda, reduces funds below the aggregate level reported in the previous budget submission for contracts that augment staff functions.

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Office of Secretary Of Defense

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APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE			PROJECT						
0400: Research, Development, Test & Evaluation, Defense-Wide		PE 0603716D8Z: Strategic Environmental Research and Development Program (SERDP)			P470: Strategic Environmental Research and Development Program (SERDP)						
BA 3: Advanced Technology Development (ATD)		Research and Development Program (SERDP)			Development Program (SERDP)						
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P470: Strategic Environmental Research and Development Program (SERDP)	62.251	68.021	66.409	-	66.409	67.119	68.412	69.868	71.938	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 Response, Resource Conservation and Climate Change, 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 Programs (\$ in Millions)**

Title: Environmental Restoration	FY 2010	FY 2011	FY 2012
<p><b>Description:</b> 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.</p> <p><b>FY 2010 Accomplishments:</b></p> <p>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. SERDP continued to improve scientific understanding and develop innovative cost effective methods in support of DoD's remediation efforts and the sustainment of DoD ranges. A significant accomplishment was the increased understanding of the degradation of vinyl chloride in groundwater and the determination that degradation can occur under microaerophilic conditions. This knowledge will be key to developing more effective remediation strategies for DoD sites contaminated with chlorinated solvents. New initiatives begun in FY 2010 addressed innovative risk assessment approaches for military unique compounds, the options and limitations for treatment of persistent contaminated groundwater plumes, and</p>	19.052	20.443	18.067

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

bioavailability of contamination found on DoD ranges and sediments. A description of all new FY 2010 ER projects can be found at [www.serdp-estcp.org](http://www.serdp-estcp.org).

**FY 2011 Plans:**

New research initiatives will focus on assessing the environmental impacts of munitions compounds in the marine environment, in situ remediation of perfluoroalkyl contaminated groundwater, improving the understanding of impacts to groundwater quality post-remediation, and improved assessments of munitions constituent source terms on operational ranges. New FY 2011 ER selected projects briefed the Scientific Advisory Board in September and October 2010 and are now underway. Details will be available at [www.serdp-estcp.org](http://www.serdp-estcp.org).

**FY 2012 Plans:**

New research initiatives will focus on the highest priority DoD requirements to reduce DoD's liabilities by developing technologies for the cost-effective detection, characterization, containment, and remediation of contamination in soil, sediments, and water. Specific Statements of Need were released in October 2010 and will address the development of sustainable wastewater treatment processes for forward operating bases and assessing the environmental fate and impacts of insensitive munitions compounds. Details are available at [www.serdp-estcp.org](http://www.serdp-estcp.org).

**Title:** Munitions Response (MR)

**Description:** Munitions Response (MR) 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.

**FY 2010 Accomplishments:**

Investments in Munitions Response 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 developing robust statistical processing techniques to achieve high-fidelity discrimination and classification of UXO using ordinary EM61 field data. New initiatives begun in FY 2010 continued to focus on advanced sensors, signal processing, supporting technologies and protocols. In addition, projects were 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 2010 MR projects can be found at [www.serdp-estcp.org](http://www.serdp-estcp.org).

**FY 2011 Plans:**

	FY 2010	FY 2011	FY 2012
9.526	8.562	8.496	

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

	FY 2010	FY 2011	FY 2012
<p>New research initiatives will focus on advancements in underwater UXO detection and discrimination, advanced sensors, signal processing, supporting technologies, and protocols to support informed decisions and reduce the costs associated with detecting and remediating UXO. New FY 2011 MR selected projects briefed the Scientific Advisory Board in September and October 2010 and are now underway. Details will be available at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a>.</p> <p><b>FY 2012 Plans:</b> New research initiatives will focus on the highest priority DoD requirements in underwater UXO detection and discrimination, advanced sensors, signal processing, supporting technologies, and protocols to reduce the costs associated with detecting and remediating UXO on land and underwater. Specific Statements of Need were released in October 2010. Details are available at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a>.</p> <p><b>Title:</b> Resource Conservation and Climate Change (RC)</p> <p><b>Description:</b> Resource Conservation and Climate Change (RC) develops the science and technologies required to sustain training and testing ranges.</p> <p><b>FY 2010 Accomplishments:</b> 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. SERDP continued efforts to address persistent issues that severely impact installation readiness and the ability to support training and testing. A major accomplishment was the development of a modeling tool that can be used by DoD installation managers to manage land use and habitats in a way that improves both mission sustainability and conservation planning. New initiatives begun in FY 2010 are assessing 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. A description of all new FY 2010 RC projects can be found at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a></p> <p><b>FY 2011 Plans:</b> New research initiatives will assess the impacts of climate change on Alaskan ecological systems; improve the understanding of the behavioral ecology of cetaceans; develop fundamental and applied science required to manage and restore forested ecosystems on Department of Defense (DoD) lands; and improve our understanding of source-sink dynamics for populations of species of relevance to DoD resource managers. New FY 2011 RC selected projects briefed the Scientific Advisory Board in September and October 2010 and are now underway. Details will be available at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a>.</p> <p><b>FY 2012 Plans:</b> New research initiatives will focus on the highest priority DoD requirements to develop the science and technologies required to sustain training and testing ranges and respond to requirements in the 2010 QDR, including the assessment of climate change</p>	18.575	21.893	22.735

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

	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
impacts to DoD installations. Specific Statements of Need were released in October 2010. Details are available at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a> .			

**Title:** Weapons Systems and Platforms (WP)

**Description:** 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.

**FY 2010 Accomplishments:**

The Weapons Systems and Platforms program continued 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. A significant accomplishment was the development of an environmentally friendly medium caliber gun barrel liner. The process developed by a SERDP-funded effort used explosive bonding to deposit a tantalum liner along the entire length of a medium caliber gun barrel. In addition to the benefits of eliminating hazardous hexavalent chromium, the tantalum lined barrel has shown a significant increase in performance compared to a chromium plated control barrel in preliminary firing tests. Another major accomplishment was the development of an Advanced Acoustic Model. This model is a significant advancement over current noise models in that it provides a 3-dimensional simulation modeling capability for new jet aircraft that can accommodate the unique sound propagation features of advanced jet engines. New efforts begun in FY 2010 included developing alternatives to perchlorate for missile systems, new military cleaners and paint stripping techniques, sustainable materials and processes for military composites, and a scientific understanding of the impacts of lead free electronics in military hardware. A description of all new FY 2010 WP projects can be found at [www.serdp-estcp.org](http://www.serdp-estcp.org)

**FY 2011 Plans:**

New initiatives include the development of alternatives to copper- and aluminum-beryllium alloys for military applications; environmentally benign, insensitive, castable, high-performance, minimum-smoke rocket propellants; understanding the corrosion protection requirements for adhesive bond primers; combustion science to predict emissions from military platforms burning alternative fuels; and environmentally benign removal process for low observable weapons systems. New FY 2011 WP selected projects briefed the Scientific Advisory Board in September and October 2010 and are now underway. Details will be available at [www.serdp-estcp.org](http://www.serdp-estcp.org).

**FY 2012 Plans:**

New research initiatives will focus on the highest priority DoD requirements to develop technologies and materials that reduce the waste and emissions associated with the manufacturing, maintenance, and use of DoD weapons systems and platforms

	15.098	17.123	17.111

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BA 3: Advanced Technology Development (ATD)		

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

to reduce future environmental liabilities and their associated costs and impacts. Specific Statements of Need were released in October 2010 and include development of chemical agent resistant powder topcoats; scale-up and formulation of green insensitive secondary explosives; waste-to-energy converters for overseas contingency operations; and assessing the reliability of tin-whisker-mitigating conformal coatings. Details are available at <a href="http://www.serdp-estcp.org">www.serdp-estcp.org</a> .	FY 2010	FY 2011	FY 2012
	Accomplishments/Planned Programs Subtotals	62.251	68.021

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

N/A

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

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.