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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i>				R-1 ITEM NOMENCLATURE PE 0602720A: <i>Environmental Quality Technology</i>							
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
Total Program Element	17.545	18.364	20.837	-	20.837	20.834	21.161	21.450	23.131	Continuing	Continuing
048: <i>IND OPER POLL CTRL TEC</i>	3.080	3.186	2.653	-	2.653	2.546	2.532	2.660	3.535	Continuing	Continuing
835: <i>MIL MED ENVIRON CRIT</i>	3.176	5.836	6.175	-	6.175	6.226	6.300	6.387	6.917	Continuing	Continuing
895: <i>POLLUTION PREVENTION</i>	3.584	3.884	3.955	-	3.955	4.026	4.097	4.157	4.215	Continuing	Continuing
896: <i>BASE FAC ENVIRON QUAL</i>	5.716	5.458	8.054	-	8.054	8.036	8.232	8.246	8.464	Continuing	Continuing
F35: <i>Environmental Quality Applied Research (CA)</i>	1.989	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY10 funding realigned to higher priority efforts.
FY12 funding increase for research in Environmental Nanotechnology and Environmental Military Materials.

A. Mission Description and Budget Item Justification

This program element (PE) investigates and evaluates enabling technologies that support the long-term sustainment of Army training and testing activities by improving the Army's ability to comply with requirements mandated by federal, state and local environmental/health laws and reducing the cost of this compliance. This program develops enabling technologies to decontaminate or neutralize Army-unique hazardous and toxic wastes at sites containing waste ammunition, explosives, heavy metals, propellants, smokes, chemical munitions, and other organic contaminants (Project 048); as well as technology to avoid the potential for future hazardous waste problems (Project 835), by reducing hazardous waste generation through process modification and control, materials recycling and substitution (Project 895). This program develops technologies to predict and mitigate range and maneuver constraints associated with current and emerging weapon systems, doctrine, and regulations (Project 896).

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

Technologies developed in this PE are transitioned to PE 0603728A (Environmental Quality Technology Demonstrations).

Work in this PE is performed by the US Army Engineer Research and Development Center, Vicksburg, MS, and the US Army Research, Development and Engineering Command, Aberdeen Proving Ground, MD.

Project F355 funds Congressional Interest Items.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army				DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE				
2040: Research, Development, Test & Evaluation, Army		PE 0602720A: Environmental Quality Technology				
BA 2: Applied Research						
B. Program Change Summary (\$ in Millions)		FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget		25.469	18.364	15.943	-	15.943
Current President's Budget		17.545	18.364	20.837	-	20.837
Total Adjustments		-7.924	-	4.894	-	4.894
• Congressional General Reductions			-			
• Congressional Directed Reductions			-			
• Congressional Rescissions		-	-			
• Congressional Adds			-			
• Congressional Directed Transfers			-			
• Reprogrammings		-7.661	-			
• SBIR/STTR Transfer		-0.263	-			
• Adjustments to Budget Years		-	-	4.894	-	4.894

UNCLASSIFIED

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research				R-1 ITEM NOMENCLATURE PE 0602720A: Environmental Quality Technology				PROJECT 048: IND OPER POLL CTRL TEC			
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
048: IND OPER POLL CTRL TEC	3.080	3.186	2.653	-	2.653	2.546	2.532	2.660	3.535	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) designs and develops technologies to enable the Army to reduce or eliminate environmental impacts both in the United States and abroad. These technologies reduce the impact of legal and regulatory environmental restrictions on installation facilities, training and testing lands and ranges, as well as provide a means to avoid fines and facility shutdowns within the United States and reduce environmental impacts to the Warfighter abroad. New and innovative technologies are essential for the effective control and reduction of military unique hazardous and non-hazardous wastes on military installations and associated with contingency operations bases worldwide. Efforts focus on the impacts of new materiel that will enter the Army inventory within the next decade and beyond. This project focuses on developing sustainable environmental protection technologies that help the Army maintain environmental compliance for sources of industrial pollution such as production facilities, facility contamination, and other waste streams. Efforts abroad include a focus on designing and developing technologies for deployed forces with environmentally safe, operationally enhanced and cost effective technologies and/or processes to achieve maximum diversion, minimization, or volume reduction of base camp and field waste. Additional work is focused on environmental risk assessment for installations associated with noise, air quality and carbon footprint.

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

Work in this project is performed by the US Army Engineer Research and Development Center, Vicksburg, MS.

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

	FY 2010	FY 2011	FY 2012
Title: Sustainable Ranges and Lands Research and Development	3.080	3.186	2.653
Description: This effort supports management of operations on ranges and training lands with the intent to reduce constraints and restrictions. Technologies are targeted both toward solutions for environmental compliance and associated requirements, as well as solutions that will enhance training and testing operations.			
FY 2010 Accomplishments: Developed physiologically relevant chip/organ response on micro-fluidic sensing platforms for real-time water analysis for heavy metals (lead), anionic contaminants (perchlorate), and water toxins; completed evaluation of anaerobic fluidized bed reactor and zero valent iron treatment reduction technologies to reduce or eliminate environmental impacts from selective insensitive munitions processing residues through a bacterial process allowing the carbon and nitrogen to be recycled in natural, aerobic			

UNCLASSIFIED

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i>	R-1 ITEM NOMENCLATURE PE 0602720A: <i>Environmental Quality Technology</i>	PROJECT 048: <i>IND OPER POLL CTRL TEC</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
cycles; and developed modeling approaches to determine noise attenuation in forests and to predict impacts of cumulative land use activities on Army training ranges through research to quantify changes that vary with respect to frequency, intensity, and duration for enabling land use availability for training.			
FY 2011 Plans: Complete development of an archetype chip device for acute toxicity measurement for compounds of military interest and begin development of air emission factors associated with wildfire and prescribed-fire burns on range and training lands; investigate ecosystem response to naturally occurring fires and adjust prescribed fire regimes.			
FY 2012 Plans: Will design and develop models to project vegetation response to wild and prescribed fire regimes for best land management practices; will design and develop methods to integrate simulation capability for efficient and effective management of base camp infrastructure.			
Accomplishments/Planned Programs Subtotals		3.080	3.186
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.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research				R-1 ITEM NOMENCLATURE PE 0602720A: Environmental Quality Technology				PROJECT 835: MIL MED ENVIRON CRIT			
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
835: MIL MED ENVIRON CRIT	3.176	5.836	6.175	-	6.175	6.226	6.300	6.387	6.917	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates a quantitative means to determine the environmental and human health effects resulting from exposure to explosives, propellants, smokes, and products containing nanomaterials produced or used in Army industrial, field, and battlefield operations or disposed of through past activities. The end results of this research include: determination of acceptable contaminant concentration levels for residual munitions constituents (MCs) and munitions and explosives of concern that minimize adverse effects on the environment and human health and the development of methods that guide the design of nanomaterials such that adverse effects on human health or the environment are minimized in their designed state and when they enter the environment where they may break down. New research in toxicogenomics, nanomaterial technologies, computational/molecular modeling tools for toxicity and exposure assessment; impacts of climate change on biological processes; and attributes of sustainable energy production further reduces the uncertainty associated with both the probability of exposure and the ultimate effect if exposed. Interim products are US Environmental Protection Agency approved health advisories and criteria documents to be used in risk assessment procedures. The Army uses these criteria during negotiations with regulatory officials to set scientifically and economically appropriate cleanup and discharge limits at Army installations.

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

Work in this project is performed by the US Army Engineer Research and Development Center, Vicksburg, MS.

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

	FY 2010	FY 2011	FY 2012
Title: Military Materials in the Environment Research and Development	3.176	3.336	2.695
Description: This effort provides a quantitative means to determine the environmental and human health effects resulting from exposure to explosives, propellants, and obscurants produced in Army industrial, field, and battlefield operations or disposed of through past activities.			
FY 2010 Accomplishments: Established mathematical biological models forecasting MC toxicology; completed computational chemistry methods for the prediction of explosives degradation in water and explored methods for predicting MC binding and movement in soil;			

UNCLASSIFIED

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i>	R-1 ITEM NOMENCLATURE PE 0602720A: <i>Environmental Quality Technology</i>	PROJECT 835: <i>MIL MED ENVIRON CRIT</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
and established a nanomaterial periodic table and framework for integrating environmental attributes with nanotechnology development.			
FY 2011 Plans: Complete a computational biology model for predictive toxicology of MCs; devise computational chemistry methods relating chemical mechanisms to toxicity in soils.; complete beta version testing and release of the Training Range Environmental Evaluation and Characterization System for quantitative risk assessments of MC migration from ranges; begin developmental methods to incorporate environmental fate and effects into the design of nanomaterials; and begin analysis of environmental modeling of environmental toxicology and chemistry for composite nanomaterials used in base sustainment and blast and ballistic protection.			
FY 2012 Plans: Will construct a comprehensive data set for the binding properties of MCs and emerging contaminants in biological/physiological networks to predict impacts to ecological receptors. The effort in this program associated with computational chemistry of contaminant behavior in the environment will move to 0602720A Project 896 in FY12.			
Title: Nanotechnology-Environmental Effects		-	2.500
Description: This effort enables the Army's ability to field advanced nano-based technology by appropriate framing of the environmental impacts of nanomaterials. The end result of this research is the development of methods that guide the design of nanomaterials such that adverse effects on human health or the environment are minimized in their designed state and when they enter the environment where they may break down.			
FY 2011 Plans: Investigate developmental methods to incorporate fate and effects into the design of nanomaterials from the nano-scale or micro-scale to the macro-scale; and will begin analysis of fate and effects in soil and water for composite nanomaterials supporting base sustainment and blast and ballistic protection.			
FY 2012 Plans: Will investigate and develop quantitative relationships to characterize role of surface chemistry in the fate and transport of nanoaluminum and nanosilver with environmental media to allow for development of predictive algorithms for potential extrapolation to environmental fate and effects of other nanomaterials.			
Title: Green Remediation Technologies		-	-
Description: This effort enables the ability of the Army to control, remediate, and detect contaminations such as depleted uranium; this effort also enables reductions in the volume of waste while minimizing energy usage.			0.980

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i>	R-1 ITEM NOMENCLATURE PE 0602720A: <i>Environmental Quality Technology</i>	PROJECT 835: <i>MIL MED ENVIRON CRIT</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
FY 2012 Plans: Will investigate novel methods to control and remediate Army relevant contaminants while minimizing energy usage, transpiration requirements and volume of waste; will research new methods for detection and remediation of depleted uranium on Army lands.			
Accomplishments/Planned Programs Subtotals		3.176	5.836
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.			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research				R-1 ITEM NOMENCLATURE PE 0602720A: Environmental Quality Technology				PROJECT 895: POLLUTION PREVENTION			
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
895: POLLUTION PREVENTION	3.584	3.884	3.955	-	3.955	4.026	4.097	4.157	4.215	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

The program element (PE) develops pollution prevention technologies required to reduce/eliminate the environmental footprint resulting from the manufacture, maintenance, use and surveillance of Army ordnance and other weapon systems. This project researches and develops revolutionary technologies to eliminate or significantly reduce the environmental impacts that threaten the sustainment of production and maintenance facilities, training ranges and operational areas. The project supports the transformation of the Army by ensuring that advanced energetic materials required for high-performance munitions (gun, rocket, missile propulsion systems, and warhead explosives) are devised to meet weapons lethality/survivability stretch goals in parallel with, and in compliance to, foreseeable sustainment requirements. Specific technology thrusts include environmentally-benign explosives developed with computer modeling using Department of Defense high-performance computing resources; novel energetics that capitalize on the unique behavior of nano-scale structures; chemically engineered explosive and propellant formulations produced with minimal environmental waste, long-storage lifetime, rapid/benign environmental degradation properties, and efficient extraction and reuse; and fuses, pyrotechnics, and initiators that are free from toxic chemicals. Other focus areas include base camp energy reduction initiatives, elimination of waste streams in contingency operations and toxic metal reductions from surface finishing processes.

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

Technologies developed in this project are fully coordinated and complementary to PE 0603728A, Project 025.

Work in this project is performed by the Research, Development, and Engineering Command's, the Army Research Laboratory, Aberdeen Proving Ground, MD, the Armaments Research, Development, and Engineering Center, Picatinny Arsenal, NJ, and the Aviation and Missile Research, Development, and Engineering Center, Huntsville, AL.

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

Title: Pollution Prevention Technologies	FY 2010	FY 2011	FY 2012
Description: This effort develops pollution prevention technologies to reduce/eliminate the environmental footprint resulting from the manufacture, maintenance, use and surveillance of Army ordnance and other weapon systems.	3.584	3.884	3.955
FY 2010 Accomplishments:			

UNCLASSIFIED

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
<p>Rocket and Missile Propellants: designed and modeled the next generation environmentally benign propellant ingredients; Conventional Ammunition: designed novel, environmentally benign explosive compositions consisting of new molecules; Pyrotechnics: down-selected candidate compositions for environmentally friendly obscuration; Heavy Metal Reduction: evaluated chromate/cadmium-free materials and processes in a laboratory environment; Zero Footprint Camp: evaluated technologies in a laboratory environment that reduce base camp energy and water supply demands.</p> <p>FY 2011 Plans: Rocket and Missile Propellants: simulate performance of next generation of environmentally benign propellant compositions; Conventional Ammunition: synthesize gram quantities of novel explosive compositions and conduct screening tests to determine most effective compositions; Pyrotechnics: transition sustainable flare, delay and signal formulations to advanced technology development; Heavy Metal Reduction: mature new processes for demonstration on gun barrels and fasteners; Zero Footprint Camp: refine water recycling technologies for demonstration in relevant environment.</p> <p>FY 2012 Plans: Conventional Ammunition: will scale up novel explosive compositions to kilogram quantities and conduct limited performance evaluation; Pyrotechnics: will evaluate feasibility of using novel, environmentally benign high-nitrogen molecules in next generation pyrotechnic compositions; Heavy Metal Reduction: will mature hexavalent chromium-free stripping agents and surface activation technologies for demonstration on aircraft components and assemblies; Zero Footprint Camp: will investigate feasibility of novel water vapor reclamation concepts for use in overseas contingency operations.</p>			
Accomplishments/Planned Programs Subtotals		3.584	3.884
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.			

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 2: Applied Research				R-1 ITEM NOMENCLATURE PE 0602720A: Environmental Quality Technology				PROJECT 896: BASE FAC ENVIRON QUAL			
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
896: BASE FAC ENVIRON QUAL	5.716	5.458	8.054	-	8.054	8.036	8.232	8.246	8.464	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates technologies for environmental risk assessment, analysis, monitoring, modeling, and mitigation to support sustainable use of Army facilities, training lands, firing ranges, and airspace to reduce or eliminate environmental constraints to military missions. This project provides the Army the technical capability to manage, protect, and improve the biophysical characteristics of training and testing areas needed for realistic ranges and training lands. Technologies within this project enable users to match mission events and training schedules with the resource capabilities of specific land areas and understand how the use of those resources effect mission support and environmental compliance. The project investigates, designs, and develops novel methods and technologies to restore lands damaged during training activities and allow sustained use of installation facilities and training land resources. The project supports readiness and full use of training lands through development of threatened and endangered species monitoring technology and management technologies for species at risk. The project also designs and develops tools and technologies to avoid training restrictions and reduce constraints on training lands associated with invasive species and potential impacts from climate change.

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

Work in this project is performed by the US Army Engineer Research and Development Center, Vicksburg, MS.

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

	FY 2010	FY 2011	FY 2012
Title: Threatened and Endangered Species (TES) Management to Reduce Operational Constraints	1.532	-	-
Description: This effort develops detection techniques and models to understand multi-species population and manage threatened and endangered species at risk at Army training lands.			
FY 2010 Accomplishments: Completed development of detection techniques, multi-species population and risk prediction models and also understanding of advanced genetic methods to manage species at risk; this research assists the Army in reducing the number of future listed species and their associated constraints on military training.			
Title: Predictive Risk Assessment and Management for Army Ranges and Training Lands	4.184	5.458	4.550
Description: This effort develops technologies to minimize training land/natural resource conflicts for sustained mission support.			

UNCLASSIFIED

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
<p><i>FY 2010 Accomplishments:</i> Completed biometric sampling for detecting and assessing species invasiveness on Army ranges and training lands; developed unified landscape utility metrics for mission and resource condition to maximize landscape resources supporting evolving training doctrine.</p> <p><i>FY 2011 Plans:</i> Complete a spatially explicit, multi-objective decision support model for management optimization of multiple invasive species accounting for ecological, economic, and training impacts; quantify synergistic and antagonistic interactions between training/non-military land uses to develop quantitative methods for comparative impact analysis of training and alternative land uses.</p> <p><i>FY 2012 Plans:</i> Will determine impact of different training regimes on natural resources in terms of frequency, duration, and intensity of land use across multiple landscape scales; this information will lead to more informed and accurate predictive capabilities for impacts of training and land use.</p>			
<p><i>Title:</i> Computational Contaminant Assessment</p> <p><i>Description:</i> This effort computationally assesses contaminants to predict chemical behavior in variable environmental settings.</p> <p><i>FY 2012 Plans:</i> Will continue investigation of Army relevant chemical interactions with simple surfaces, silicon and carbon, to include prediction and measurement of adsorption properties and kinetics of adsorption, partition and diffusion coefficients and trans-cellular transport in order to better understand and more accurately predict chemical behavior in variable environmental settings. This effort was formerly under PE 0602720A Project 835.</p>		-	-
Accomplishments/Planned Programs Subtotals		5.716	5.458
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.			

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army								DATE: February 2011			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 2: <i>Applied Research</i>				R-1 ITEM NOMENCLATURE PE 0602720A: <i>Environmental Quality Technology</i>				PROJECT F35: <i>Environmental Quality Applied Research (CA)</i>			
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
F35: <i>Environmental Quality Applied Research (CA)</i>	1.989	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification
 Congressional Interest Item funding for Environmental Quality applied research.

<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>	FY 2010	FY 2011	FY 2012
<i>Title:</i> Chemical Materials and Environmental Modeling Project <i>Description:</i> This is a Congressional Interest Item. <i>FY 2010 Accomplishments:</i> Initiated action with Jackson State University to address biodegradation of structurally varying nerve agents and related compounds that will improve detection, protection, and treatment of highly dangerous substances.	1.989	-	-
Accomplishments/Planned Programs Subtotals	1.989	-	-

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.