Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*							
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	16.584	15.878	15.959	-	15.959	14.027	14.182	14.724	14.406	Continuing	Continuing
002: *ENVIRONMENTAL COMPLIANCE TECHNOLOGY*	2.096	2.131	4.694	-	4.694	2.311	2.300	2.843	2.378	Continuing	Continuing
025: *POLLUTION PREVENTION TECHNOLOGY*	3.497	3.659	3.718	-	3.718	3.780	3.847	3.907	3.973	Continuing	Continuing
03E: *ENVIRONMENTAL RESTORATION TECHNOLOGY*	9.697	10.088	7.547	-	7.547	7.936	8.035	7.974	8.055	Continuing	Continuing
03F: *Environmental Quality Tech Demonstrations (CA)*	1.294	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY12 funding realigned to higher priority efforts.

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates technologies that assist Army installations in becoming environmentally compatible without compromising the readiness or training critical to the success of the future force. This program includes technology demonstrations for: restoration of sites contaminated with toxic and/or hazardous materials (such as unexploded ordnance) resulting from Army operations; pollution prevention to minimize the Army's use and generation of toxic chemicals and hazardous wastes; compliance with environmental laws by control, treatment, and disposal of hazardous waste products; and conservation of natural and cultural resources while providing a realistic environment for mission activities (Projects 002, 025, and 03E). This program demonstrates technological feasibility, assesses the technology as well as its producibility, and transitions mature technologies from the laboratory to the user. Technologies developed by this program element improve the ability of the Army to achieve environmental restoration and compliance at its installations, at active/ inactive ranges and other training lands, and at its rework as well as production facilities. Technologies demonstrated focus on reducing the cost of treating hazardous effluents and remediating Army sites contaminated by hazardous/toxic material.

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.

This program is fully coordinated and complementary to PE 0602720A (Environmental Quality Technology).

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603728A: *Environmental Quality Technology Demonstrations*

Project 03F funds Congressional Interest Items.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	16.121	15.878	18.709	-	18.709
Current President's Budget	16.584	15.878	15.959	-	15.959
Total Adjustments	0.463	-	-2.750	-	-2.750
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	0.797	-			
• SBIR/STTR Transfer	-0.334	-			
• Adjustments to Budget Years	-	-	-2.750	-	-2.750

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 002: *ENVIRONMENTAL COMPLIANCE TECHNOLOGY*	

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
002: *ENVIRONMENTAL COMPLIANCE TECHNOLOGY*	2.096	2.131	4.694	-	4.694	2.311	2.300	2.843	2.378	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates technologies transitioned from PE 0602720A (Environmental Quality Technology), Projects 048 and 896, that assist Army installations in achieving environmental compliance. These technologies reduce the cost of treating hazardous effluents from Army installations, including forward operating bases, to satisfy increasingly stringent waste, wastewater and air pollutant discharge requirements. Army facilities are subject to fines and facility shutdowns for violation of federal, state, and local environmental regulations. This technology is essential to control and reduce the generation of waste to satisfy hazardous waste reduction goals and to avoid future environmental costs as well as liabilities to the Army. Efforts under this project enable the Army to reduce environmental constraints at installations while complying with the myriad of federal, state, and host country environmental regulations and policy. Technologies demonstrated also reduce the cost of resolving training noise compliance issues for the Army, avoid reductions in availability of training facilities, and sustain the viability of testing and training ranges as well as protect the critical resources, i.e. land, air, and waters of the Army.

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: Installation Operations	2.096	2.131	4.694
Description: This effort demonstrates environmentally safe and cost-effective technologies to manage and reduce the increase in noise and pollution concerns associated with training ranges.			
FY 2010 Accomplishments: Developed and matured a cell-based sensor for detecting toxins with on-board reactive oxygen species electrode; developed a portable device to measure low frequency characteristics of ground surfaces to provide accurate single event noise assessments for managing the training noise environment.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 002: *ENVIRONMENTAL COMPLIANCE TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Complete integration of cell-based sensor components and will initiate performance evaluation phase for field assessment of perchlorate and lead. Initiate demonstration of noise mapping software utilizing real-time meteorology to enable the Army's Operational Noise Program and Sustainable Range Program. ***FY 2012 Plans:*** Will mature and demonstrate a cell-based, field portable sensor design for real time analysis to detect and quantify or evaluate toxicity of water; will mature noise assessment models corrected to adequately reflect discrete noise events, local community response to training noise metrics, and continuous noise mapping software to ensure compliance.			
Accomplishments/Planned Programs Subtotals	2.096	2.131	4.694

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, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 025: *POLLUTION PREVENTION TECHNOLOGY*	

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
025: *POLLUTION PREVENTION TECHNOLOGY*	3.497	3.659	3.718	-	3.718	3.780	3.847	3.907	3.973	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates pollution prevention advanced technologies required for sustainable operation of Army weapon systems, to include compliance with regulations mandated by federal, state, and local environmental and health laws. Technology thrusts under this project include demonstration of advanced technologies to enable sustainment of propellant, explosive and pyrotechnic production and maintenance facilities and training ranges through elimination or significant reduction of environmental impacts. These technologies will ensure that advanced energetic materials required for future force's high performance munitions are developed that meet weapons lethality and survivability goals and that are compliant with environmental and health laws.

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.

The project is fully coordinated and complementary to PE 0602720A, Project 895. This project transitions technologies developed under that PE.

Work in this project is performed by the Research, Development, and Engineering Command 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, Redstone Arsenal, AL in conjunction with the Army Public Health Command (Provisional), Aberdeen Proving Ground, MD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Pollution Prevention Technology	3.497	3.659	3.718
Description: This effort demonstrates pollution prevention advanced technologies required to sustain operation of Army weapons systems to comply with state, federal, and local environmental and health laws and regulations.			
FY 2010 Accomplishments: Rocket and Missile Propellants: demonstrated hypergolic propulsion system as potential alternative to ammonium perchlorate; Conventional Ammunition: assessed performance of potential RDX replacements in representative compositions; Pyrotechnics: evaluated low-toxicity colored smoke formulations in a relevant environment.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 025: *POLLUTION PREVENTION TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Rocket and Missile Propellants: develop flight-scale hardware for hydrazine and ammonium perchlorate replacement rocket motors; Conventional Ammunition: perform material qualification evaluation and assess performance of representative compositions for eventual transition into an end-item; Pyrotechnics: demonstrate a perchlorate-free countermeasure in a relevant end-item. ***FY 2012 Plans:*** Rocket and Missile Propellants: will finalize design of flight-scale hardware and prepare to conduct flight performance evaluation; Conventional Ammunition: will refine and optimize compositions in a relevant end item; Pyrotechnics: will integrate flare, delay and signal formulations into system prototypes.			
Accomplishments/Planned Programs Subtotals	3.497	3.659	3.718

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, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 03E: *ENVIRONMENTAL RESTORATION TECHNOLOGY*	

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
03E: *ENVIRONMENTAL RESTORATION TECHNOLOGY*	9.697	10.088	7.547	-	7.547	7.936	8.035	7.974	8.055	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates technologies transitioned from PE 0602720A (Environmental Quality Technology), Project 835 that improve the Army's ability to achieve cost-effective environmental restoration and management of contamination resulting from Army training or operations at its installations, active and inactive ranges, its rework and production facilities, and on the battlefield. Advanced development activities address the management/mitigation of materials released to the natural environment and residual environmental effects of military training and operations. The emphasis of this effort includes restoration of legacy materials, e.g., traditional explosives and energetic; management of new materials, e.g., nanomaterials and emerging contaminants; and mitigation of residual impacts from implementation of sustainable technologies and processes. Technologies matured within this project enable the Army to cost effectively address current and future environmental liabilities resulting from the use of militarily relevant materials in the environment and implementation of the new family of sustainable technologies for energy production. Current and planned efforts enable the Army to efficiently characterize, evaluate, assess, and remediate soil and groundwater at installations, ranges, facilities, and during battlefield operations. Efforts also identify ways to economically comply with the myriad of federal, state, and host country regulations dealing with contaminated soil and groundwater. A key aspect of this work is the enhancement of risk assessment and life cycle analysis techniques that can more accurately display the environmental liabilities associated with fielding new systems and technologies. This program includes pilot scale field studies to establish technological feasibility and assess performance and productivity of the risk assessment techniques.

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: Unexploded Ordnance (UXO)	2.060	3.077	2.200
Description: This effort matures and demonstrates active range ordnance impact assessment and positioning system in relevant environments. This effort also develops real time detection and discrimination methodologies for unique and emerging unexploded ordnance (UXO).			
FY 2010 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 03E: *ENVIRONMENTAL RESTORATION TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Identified range monitoring and maintenance systems for sustainable range operations; retained identification and characterization of unique and emerging UXO; and initiated development of protocols for adaptive detection. ***FY 2011 Plans:*** Complete performance characterization of UXO related range maintenance technologies; complete identification and characterization of unique and emerging UXO;complete protocols for implementation of adaptive, real time UXO detection, remediation, ordnance impact and monitoring; develop detection and discrimination methodologies for unique and emerging UXO; continue working on adaptive, real time UXO detection and remediation, methodologies. ***FY 2012 Plans:*** Will mature and demonstrate the active range ordnance impact assessment and positioning system in a relevant environment; will continue development of real time detection and discrimination methodologies for unique and emerging UXO.			
Title: Hazard/Risk Assessment Tools for Toxicity of Munitions Constituents (MCs) ***Description:*** This effort develops tools to assess hazard and risk of toxicity due to munitions constituents. ***FY 2010 Accomplishments:*** Devised mathematical models of effects and toxicity due to existing MCs. Characterized multiple stressor impacts on toxicity. Identified developmental pathways affected by MCs and toxicity mechanisms in alternate ecological species, and completed a cross species validation of MC effects; devised computational chemistry predictive methods of chemical structures and physical properties of MC adsorbed soils, MC reactivity and decomposition, and chemical mechanisms of MC breakdown by soil microbes. ***FY 2011 Plans:*** Complete construction of a computational biology tool for predictive toxicology; will define hydraulic, biological, geophysical, and chemical models for integration into a training range environmental evaluation and characterization system; will identify approaches for environmental life-cycle assessment of nanomaterials to support advanced Warfighter technologies development. ***FY 2012 Plans:*** Will provide a beta-version of computational tool for predictive toxicology for user review that implements ab initio quantum chemical and molecular dynamics approaches to aid in the prediction of sorption properties of MCs and emerging contaminants; will mature and demonstrate tools for rapid, standardized, and quantitative measurement of effects and toxicity from current MCs using toxicogenomics and computational biology.	6.843	7.011	4.347
Title: Characterization, Evaluation and Remediation of Distributed Source Contamination on Army Ranges ***Description:*** This effort provides capabilities to rapidly and accurately characterize, evaluate, and remediate distributed source contamination on Army ranges.	0.509	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 03E: *ENVIRONMENTAL RESTORATION TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Provided the capability to rapidly and accurately quantify MC sources, distribution, and transport in soil and surface water and to cost-effectively manage residual MCs on active Army training ranges. This technology is in use in the ongoing Army Range Assessment Program providing improved certainty in site sampling and risk assessment.			
Title: Long Term Monitoring Applications ***Description:*** This effort develops and demonstrates monitoring technologies for long term monitoring of Army-related contamination. ***FY 2010 Accomplishments:*** Completed the development of a rapid, sensitive, near real time technology that provided on-site assessment of Army-related contamination; this technology provides time and cost savings by reducing the need for shipping groundwater samples to labs for analysis.	0.285	-	-
Title: Green Remediation Technologies ***Description:*** This effort investigates and matures technologies to control contaminant transport in soil on training ranges as well as assess and demonstrate novel detection capabilities for depleted Uranium on Army lands. ***FY 2012 Plans:*** Will begin assessment and maturation of bioreactor technologies for control of contaminant transport in soil on training ranges; will assess and demonstrate novel detection capabilities for depleted Uranium on Army lands.	-	-	1.000
Accomplishments/Planned Programs Subtotals	9.697	10.088	7.547

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, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603728A: *Environmental Quality Technology Demonstrations*	PROJECT 03F: *Environmental Quality Tech Demonstrations (CA)*	

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
03F: *Environmental Quality Tech Demonstrations (CA)*	1.294	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This is a Congressional Interest Item

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Wastewater Treatment System ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Researched and developed a transportable wastewater treatment system capable of supporting a 600-man forward operating base or civilian disaster relief base camp.	0.497	-	-
Title: Texas Research Institute for Environmental Studies ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed technology to recover waste water and sludge into a potable and sustainable source of water.	0.797	-	-
Accomplishments/Planned Programs Subtotals	1.294	-	-

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.