ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**

	COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
	Total Program Element (PE) Cost	12694	20462	14666	12906	13826	14780	16225
002	ENVIRONMENTAL COMPLIANCE TECHNOLOGY	1725	1399	657	1346	1952	1999	2045
025	POLLUTION PREVENTION TECHNOLOGY	792	2333	2788	3252	3401	3483	3574
03E	ENVIRONMENTAL RESTORATION TECHNOLOGY	5890	11840	11221	8308	8473	9298	10606
03F	ENVIRONMENTAL QUALITY TECH DEMONSTRATIONS (CA)	0	2420	0	0	0	0	0
EM3	PROTON EXCHANGE MEMBRANE FUEL CELL DEMO	4287	2470	0	0	0	0	0

A. Mission Description and Budget Item Justification: The objective of this program element is to mature and demonstrate technologies that will assist Army installations in becoming environmentally compatible without compromising the readiness or training critical to the success of the Future Force. Technologies demonstrated within this program element are transitioned from program element 0602720A (Environmental Quality Technology). This program includes technology demonstrations for: (1) restoration of sites contaminated with toxic and/or hazardous materials (such as unexploded ordnance [UXO]) resulting from Army operations; (2) pollution prevention to minimize the Army's use and generation of toxic chemicals and hazardous wastes; (3) compliance with environmental laws by control, treatment, and disposal of hazardous waste products; and (4) conservation of natural and cultural resources while providing a realistic environment for mission activities. This program demonstrates technological feasibility, assesses technology operability and producibility, and transitions technology from the laboratory to field use. Technologies developed by this program element will improve the Army's ability to achieve environmental restoration and compliance at its installations, at active and inactive ranges and other training lands, and at its rework and production facilities. Technologies demonstrated will focus on reducing the cost of treating hazardous effluents and remediating Army sites contaminated by hazardous/toxic materiel. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this program element is performed by the U.S. Army Engineer Research and Development Center that is headquartered at Vicksburg, Mississippi, and the U.S. Army Research, Development and Engineering Command that is headquartered at Fort Belvoir, Virginia.

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	12846	15776	14897
Current Budget (FY 2005 PB)	12694	20462	14666
Total Adjustments	-152	4686	-231
Congressional program reductions		-188	
Congressional rescissions			
Congressional increases		4950	
Reprogrammings	-152	-76	
SBIR/STTR Transfer			
Adjustments to Budget Years			-231

Significant Change Explanation.
FY04 - Two FY04 Congressional adds totaling $4950 were added to this PE.

Projects with no R-2As:
- ($2398) PEM Demonstration Program, Project EM3: The objective of this one year Congressional add is to purchase, test and assess residential-sized PEM fuel cell systems for military applications. No additional funding is required to complete this project.
- ($2349) Environmental Compliance Technology (Defense Acquisition of Developmental Technology, Project 03F: The objective of this one year Congressional add is to develop, test and assess new military products by linking small businesses and military stakeholders. No additional funding is required to complete this project.

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February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**002**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
002	ENVIRONMENTAL COMPLIANCE TECHNOLOGY	1725	1399	657	1346	1952	1999	2045

A. Mission Description and Budget Item Justification: This project will mature and demonstrate technologies transitioned from program element 0602720A (Environmental Quality Technology), projects 048 and 896 that will assist Army installations in achieving environmental compliance. These technologies will reduce the cost of treating hazardous effluents from Army installations, including ammunition plants, depots and arsenals, to satisfy increasingly stringent wastewater and air pollutant discharge standards. Army facilities are now subject to fines and facility shutdowns for violation of Federal, state, and local air and wastewater discharge regulations. This technology is essential to control and reduce the generation of wastes to satisfy hazardous waste reduction goals, and to avoid future hazardous waste disposal costs and liabilities to the Army. Technology demonstrated will also reduce the cost of training noise compliance issues for the Army, avoid reductions in availability of training facilities, and sustain the viability of testing and training ranges. Efforts under this project will enable the Army to reduce pollution at installations while complying with the myriad of Federal, state, and host country regulations dealing with hazardous wastewater, air emissions, and solid wastes. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the U.S. Army Engineer Research and Development Center that is headquartered at Vicksburg, Mississippi.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Installation Operations – Demonstrate environmentally safe and cost-effective technologies for removing lead-based paint and reducing Hazardous Air Pollutants (HAP) emissions from Army sources to meet National Emission Standards for HAP. In FY03, demonstrated lead removal technologies that result in non-hazardous waste that leaches less than the U.S. Environmental Protection Agency criterion of 5 ppm lead. Demonstrated rotating media biofilter technology for control of hazardous air pollutants emissions from surface coating and cleaning operations. In FY04, mature and demonstrate zero emission control system for control of HAP emissions from chromium plating operations. In FY05, will mature and demonstrate complete emission control system for demil furnaces.	1725	1359	657
Small Business Innovative Research/Small Business Technology Transfer Programs	0	40	0
Totals	1725	1399	657

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**025**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
025	POLLUTION PREVENTION TECHNOLOGY	792	2333	2788	3252	3401	3483	3574

A. Mission Description and Budget Item Justification: The objective of this project is to mature and demonstrate pollution prevention advanced technologies required to comply with regulations mandated by Federal, State and Local environmental and health laws. Technology thrusts under this project include: (1) demonstration of new coating materials and processes to comply with existing and new national laws and local regulations, (2) demonstration of advanced technologies for the reuse and recycling of solid waste resulting from barracks and motor pool modernization programs required to meet the operational needs of the Future Force, and (3) demonstration of advanced technologies to eliminate or significantly reduce the environmental impacts that threaten the sustainment of rocket and missile propellant production and maintenance facilities, and training ranges. These propellant technologies are transitioned from program element 0602720A, project 895, and will ensure that advanced energetic materials required for FCS high performance munitions are developed that meet weapons lethality and survivability stretch goals. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the Army Research Laboratory located at Aberdeen, Maryland, the U.S. Army Engineer Research and Development Center headquartered at Vicksburg, Mississippi, and the Aviation and Missile Research, Development and Engineering Center located at Huntsville, Alabama.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Sustainable Painting Operations – In FY03, reformulated, evaluated, qualified and implemented hazardous air pollutant (HAP) free rubber-to-metal bonding materials and procedures. In FY04, demonstrate HAP free general and high performance munitions coating materials. In FY05, will demonstrate HAP free solvents for depainting. Solid Waste Diversion - In FY04, mature demolition debris reduction technologies that enable materials' reuse and recycling. In FY05, will demonstrate advanced technologies for the reuse and recycling of solid waste resulting from barracks and motor pool modernization programs. Ordnance Manufacture, Maintenance, Use, and Surveillance - In FY05, will demonstrate benign propellant alternatives that eliminate or significantly reduce the environmental impacts associated with the manufacture, maintenance, use and surveillance of rocket and missile propellants.	792	2265	2788
Small Business Innovative Research/Small Business Technology Transfer Programs	0	68	0
Totals	792	2333	2788

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February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**03E**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
03E	ENVIRONMENTAL RESTORATION TECHNOLOGY	5890	11840	11221	8308	8473	9298	10606

A. Mission Description and Budget Item Justification: This project will mature and demonstrate technologies transitioned from program element 0602720A (Environmental Quality Technology), projects F25 and 835 that improve the Army's ability to achieve cost-effective environmental restoration of contaminated sites at its installations, active and inactive ranges, its rework and production facilities, and the battlefield. Technologies demonstrated within this project focus on reducing the cost of remediation of Army sites contaminated by hazardous/toxic material. Efforts under this project will enable the Army to prevent pollution of the air, soil, and groundwater at installations, ranges, facilities, and battlefield operations, and to comply with the myriad of Federal, state, and host country regulations dealing with contaminated soil and groundwater. This program includes demonstrations of proof of technological feasibility and assessments of operability and productivity, and includes technology transition from the laboratory to demonstration/validation funded under program element 0603779A (Environmental Quality Technology - Dem/Val), project 04E. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the U.S. Army Engineer Research and Development Center that is headquartered at Vicksburg, Mississippi.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Unexploded Ordnance (UXO) – In FY03, developed and initiated a demonstration plan for a series of UXO detection/discrimination multi-sensing and processing data acquisition/data analysis methods, each tailored to a specific set of site environmental conditions. In FY04, demonstrate an integrated suite of UXO detection multi-sensing and processing modes optimized for site-specific environmental characteristics. Fabricate an optimized multi-sensor and data fusion analysis UXO detection/discrimination system. Transition UXO detection/discrimination sensors and multi-sensing processes to the Army Environmental Center for demonstration/validation.	2003	919	0

Accomplishments/Planned Program (continued)	FY 2003	FY 2004	FY 2005
Hazard/Risk Assessment Tools for Military Unique Compounds – In FY03, validated comprehensive screening, toxicity, and bioaccumulation models and integrated into the Army Risk Assessment Modeling System (ARAMS). In FY04, complete version 2.0 of ARAMS containing higher order assessment methods (i.e., Geographic Information System based spatially explicit wildlife exposure model and contaminant fate and transport models). Demonstrate and validate a rigorous ARAMS that seamlessly links models of exposure/effects with toxicological data for multiple species. In FY05, will complete ARAMS version 2.1 with tutorials and case studies of cost effectiveness capable of assessing contaminant transport through multiple media types such as different soil types and predicting contaminant exposure and toxicity levels in humans and other organisms of concern.	3887	5403	3815
In Situ Remediation Technologies for Contaminated Groundwater and Soils – In FY04, demonstrate technologies for in situ physical and biological cleanup (in place without pumping or excavation) of explosive materials in groundwater and demonstrate commercial off-the-shelf technologies for monitoring and analyzing military unique compounds on site. In FY05, will evaluate at pilot scale levels advanced electro-kinetic treatment technologies for lead removal from soils; in situ reactive barriers and/or reactive barriers coupled with biodegradation for treating explosive materials in groundwater; and base hydrolysis for explosives contamination.	0	2644	3030
Characterization, Evaluation and Remediation of Distributed Source Contamination on Army Ranges – In FY04, demonstrate aggressive chemical metal treatment alternatives for small arms training ranges. Demonstrate recycling metal contaminated extracts for soils treatment systems. In FY05, will develop predictive model for distributed source contamination impacts on inactive and live fire training ranges. Will adapt and demonstrate hazardous wastes site restoration processes and techniques for application to distributed contamination sources on inactive and live fire ranges.	0	1610	3030
Long Term Monitoring Applications - In FY04, begin advanced development of on-site sensors and quantitative chemical analysis of military relevant contaminants for in situ, near real-time monitoring of environmental cleanup actions. In FY05, will continue development of cost-effective, long term monitoring systems that will greatly reduce the frequency of manual sampling and off-site laboratory analysis.	0	919	1346
Small Business Innovative Research/Small Business Technology Transfer Programs	0	345	0
Totals	5890	11840	11221