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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603728A I Environmental Quality Technology Demonstrations							
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	-	11.540	11.445	10.727	-	10.727	11.137	10.382	10.570	10.773	-	-
002: Environmental Compliance Technology	-	1.920	3.171	3.278	-	3.278	3.262	2.190	2.336	2.431	-	-
025: Pollution Prevention Technology	-	2.920	-	1.489	-	1.489	1.489	1.488	1.489	1.489	-	-
03E: Environmental Restoration Technology	-	6.700	6.024	5.960	-	5.960	6.386	6.704	6.745	6.853	-	-
03F: Environmental Quality Tech Demonstrations (CA)	-	-	2.250	-	-	-	-	-	-	-	-	-
Note FY16 increase for pollution prevention efforts.												
A. Mission Description and Budget Item Justification This program element (PE) matures and demonstrates technologies that assist the Army in becoming environmentally compliant and limiting future liability without compromising readiness or training assets critical to the success of the future force. Project 002 demonstrates tools and methods for compliance with environmental laws relevant to conservation of natural and cultural resource laws while providing a flexible realistic training environment for mission activities. Project 025 demonstrates pollution prevention tools and methods to minimize the Army's use and generation of toxic chemicals and hazardous wastes. Project 03E focuses on maturation and demonstration of technologies for advanced life cycle analysis, advanced sensing, and advanced remediation of Army-unique toxic or hazardous materials. This program demonstrates technological feasibility 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 in modernization programs. Technologies demonstrated focus on reducing current and future environmental liability costs. The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy 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.												

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Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603728A I Environmental Quality Technology Demonstrations				
B. Program Change Summary (\$ in Millions)		FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget		11.739	9.197	8.690	-	8.690
Current President's Budget		11.540	11.445	10.727	-	10.727
Total Adjustments		-0.199	2.248	2.037	-	2.037
• Congressional General Reductions		-	-0.002			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	2.250			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.199	-			
• Adjustments to Budget Years		-	-	2.037	-	2.037
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 03F: Environmental Quality Tech Demonstrations (CA)						
Congressional Add: Program Increase						
Congressional Add Subtotals for Project: 03F						
Congressional Add Totals for all Projects						

FY 2014	FY 2015
-	2.250
-	2.250
-	2.250

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603728A / Environmental Quality Technology Demonstrations				Project (Number/Name) 002 / Environmental Compliance Technology			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
002: Environmental Compliance Technology	-	1.920	3.171	3.278	-	3.278	3.262	2.190	2.336	2.431	-	-
Note Not applicable for this item												
A. Mission Description and Budget Item Justification This project matures and demonstrates technologies transitioned from PE 0602720A (Environmental Quality Technology), Projects 048 and 896, that assist Army installations and operations in achieving environmental compliance. Army facilities are subject to fines and facility shutdowns for violation of federal, state, and local environmental regulations. 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. Current and planned efforts enable the Army to efficiently characterize, evaluate, assess, and sustain training and testing capacity; power and water management in contingency operations and on installations; and noise mitigation and management. Technologies demonstrated aim to reduce the cost of resolving 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. Work in this project supports the Army S&T Innovation Enablers (formerly Enduring Technologies) Portfolio. The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy, 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 2014	FY 2015	FY 2016	
Title: Sustainable Ranges and Lands									1.920	3.171	0.303	
Description: This effort provides ecosystem vulnerability assessment and ecosystem analysis, monitoring, modeling and mitigation technologies to support sustainable, unconstrained, realistic access and use of the Army's ranges and lands. 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 2014 Accomplishments: Evaluated emerging biofiltration technologies applicable to gray water treatment at contingency bases based on technology performance, efficiency, and robustness; developed full scale design specifications for a robust gray water pretreatment component technology based on biofiltration evaluation; developed detailed technology test plan in coordination with Army Test												

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Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>	Project (Number/Name) 002 / <i>Environmental Compliance Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2014	FY 2015
and Evaluation Command, US Army Public Health Command, and US Army Tank Automotive Research, Development and Engineering Center; matured a dynamic simulation model which integrates the complex adaptive system algorithms representing the dynamic operating systems of a contingency base.			
FY 2015 Plans: Develop and evaluate gray water treatment and reuse system (G-WTRS) that is designed to reduce water demand and sustainment cost at 600-3000 personnel contingency operating bases; perform pilot scale testing of G-WTRS prototype; conduct baseline flow, water quality, energy consumption, and maintenance testing; optimize G-WTRS design and operation based on pilot scale testing for maximal performance and energy efficiency; facilitate Army Evaluation Center certification of G-WTRS; mature an intuitive integrated planning, design, and analysis model that addresses power, water, waste and protection related design and resource requirements for contingency bases ranging in size from 50-2000 population; validate standalone models for power, water, waste (solid, sanitary, and hazardous) and protection; mature characterization and forecasting capabilities to assess multi-scale ecological response to compliance mandated altered fire regimes and the consequences for accessible, sustainable and realistic military training lands.			
FY 2016 Plans: Will mature and validate the design for a robust, operationally-efficient gray water reuse system that can reduce water demand at Contingency Operating Bases (COBs) of 600-3000 Pax capacity that will result in US Army Public Health Command and US Army Test and Evaluation Command safety and performance approval for fully integrated grey water reuse system for Contingency bases.			
Title: Adaptive & Resilient Installations		-	-
Description: This effort demonstrates sustainable, cost efficient and effective facilities; and provides technologies and techniques for achieving resilient and sustainable installation and base operations. Investigates the applicability of utilizing automotive adaptive construction techniques to impact manpower and materials necessary for contingency construction through the development of a prototype additive constructive system utilizing cementitious materials.			2.975
FY 2016 Plans: Will integrate contingency base planning, design, operations and management modeling tools that link with the Joint Construction Management System (JCMS) to provide a single system for all Services to plan and execute construction in support of the Joint Force. Will assess the cementitious material requirements and characteristics required for automated additive construction that will be assessed utilizing a rudimentary pre development prototype system.			
Accomplishments/Planned Programs Subtotals		1.920	3.171
			3.278

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Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>	Project (Number/Name) 002 / <i>Environmental Compliance Technology</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603728A / Environmental Quality Technology Demonstrations				Project (Number/Name) 025 / Pollution Prevention Technology			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
025: Pollution Prevention Technology	-	2.920	-	1.489	-	1.489	1.489	1.488	1.489	1.489	-	-
Note Not applicable for this item												
A. Mission Description and Budget Item Justification This project 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. Technology thrusts also include demonstration of technologies for reductions of waste streams at base camps and toxic metal reductions from surface finishing processes. Work in this project supports the Army S&T Innovation Enablers (formerly Enduring Technologies) Portfolio. The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy 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 Army Research Laboratory, Aberdeen Proving Ground, MD, the Armaments Research, Development, and Engineering Center, Picatinny Arsenal, NJ, the Aviation and Missile Research, Development, and Engineering Center, Redstone Arsenal, AL , the Natick Soldier Research, Development and Engineering Center, Natick, MA (NSRDEC), and the Tank Automotive Research, Development and Engineering Center (TARDEC), Warren, MI in conjunction with the Army Public Health Command, Aberdeen Proving Ground, MD.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2014	FY 2015	FY 2016	
Title: Pollution Prevention Technology									2.920	-	1.489	
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 2014 Accomplishments:												

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Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>	Project (Number/Name) 025 / <i>Pollution Prevention Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2014	FY 2015
Conventional Ammunition: Conducted large-scale performance and insensitive munitions testing on environmentally benign formulation in relevant end item; Pyrotechnics: Integrated chromate-free delay composition into relevant end item; Toxic Metal Reduction: Demonstrated alternatives to chromic acid anodizing for common aircraft substrates; Zero Footprint Camp: Selected and matured high-payoff approaches for reducing fresh water demand and wastewater generation in contingency bases. FY 2016 Plans: Conventional Ammunition: will qualify lead-free primary explosive from full-scale production lot; Pyrotechnics: will conduct prototype testing for chromate- and lead-free gasless delay formulations in a relevant end item; Toxic Metal Reduction: will conduct firing tests for large caliber gun barrel with hexavalent chromium-free liner.			
Accomplishments/Planned Programs Subtotals		2.920	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			
E. Performance Metrics			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Army										Date: February 2015		
Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603728A / Environmental Quality Technology Demonstrations				Project (Number/Name) 03E / Environmental Restoration Technology			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
03E: Environmental Restoration Technology	-	6.700	6.024	5.960	-	5.960	6.386	6.704	6.745	6.853	-	-
Note Not applicable for this item												
A. Mission Description and Budget Item Justification This project matures and demonstrates technologies transitioned from PE 0602720A (Environmental Quality Technology), Projects 835 and 896 by addressing the management/mitigation of materials and chemicals released to the natural environment and residual environmental effects of military training and operations. The emphasis of this effort includes remediation of legacy materials, e.g., traditional explosives energetics, and unexploded ordnance; 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 and chemicals in the environment. Current and planned efforts enable the Army to efficiently characterize, evaluate, assess, and remediate soil and water at installations, ranges, facilities, and during operations in the face of changing weather and climatic conditions. Efforts also identify ways to economically comply with the myriad of federal, state, and host country regulations dealing with contaminated soil and water. A key aspect of this work is the enhancement of risk assessment and life cycle analysis techniques that can more accurately predict and identify 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 mitigation techniques. Work in this project supports the Army S&T Innovation Enablers (formerly Enduring Technologies) Portfolio. The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy 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 2014	FY 2015	FY 2016	
Title: Sustainable Ordnance Mitigation and Management									1.450	1.335	1.300	
Description: This effort develops real time detection and discrimination methodologies for unique and emerging non-metallic unexploded ordnance (UXO).												
FY 2014 Accomplishments:												

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Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>	Project (Number/Name) 03E / <i>Environmental Restoration Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2014	FY 2015	FY 2016
Developed a networked semi- to-fully-autonomous mobile platform with the operational capability to mitigate hazardous UXOs on military ranges. FY 2015 Plans: Develop electromagnetic induction algorithms for detection and discrimination of emerging non-metallic intermediate electrically conductive materials- based munitions, and models and algorithms applicable to difficult sensing environments. FY 2016 Plans: Will validate algorithms for the detection and discrimination of intermediate electrically conductive material (IECM) munitions; and will conduct field evaluations of electromagnetic induction (EMI) sensor systems on test ranges with the capability to detect non-metallic IECM munitions.				
Title: Hazard Assessment for Military Materials Description: This effort demonstrates tools to assess hazard and risk of Army-unique chemicals and material. The tools provide for rapid environmental baseline survey reporting and screening assessments of existing and future militarily relevant compounds and allow for improved predictive risk assessment and provide environmental life cycle assessment capability. FY 2014 Accomplishments: Demonstrated a toolkit with optimized sensor technologies for rapid and reliable data collection providing real time analysis for contamination within an operational environment. FY 2015 Plans: Integrate a suite of environmental-quality sensors with analytical capabilities to provide environmental guidance and data visualization associated with environmental monitoring in Army operations in theater; develop rapid hazard screening tools for new Army compounds. FY 2016 Plans: Will mature sensor technologies (e.g. biological sensors, geochemical sensors and petroleum kit additions) for rapid and reliable data collection providing real time screening for contamination within an operational environment.		0.863	0.722	1.100
Title: Technologies for Sustainable and Green Operations and Acquisition Description: This effort investigates and matures technologies to control contaminant transport in environmental media on Army lands and mission spaces as well as assesses and demonstrates novel detection, remediation and mitigation capabilities for existing and emerging contaminants. FY 2014 Accomplishments:		2.262	2.043	2.089

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Appropriation/Budget Activity 2040 / 3		R-1 Program Element (Number/Name) PE 0603728A / Environmental Quality Technology Demonstrations	Project (Number/Name) 03E / Environmental Restoration Technology		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2014	FY 2015	FY 2016
Provided an integrated approach to contamination management in range and installation design; developed methods for the cost effective and environmentally protective management and/or removal of small (size of the granular media or smaller) metallic Depleted Uranium and residues from affected soils and sands; developed a virtual model for wastewater treatment of munitions production water and investigate new technologies for improved water quality of surface water and wetlands impacted by development and use of new munitions. FY 2015 Plans: Develop cost-effective, efficient, and integrative tools for remediation of contaminated wastewater from insensitive munitions production. Tools are planned for rapid transition under technology transition agreement with the Project Director Joint Services for next generation Army ammunition Industrial Base Insensitive Munitions (IM) Wastewater Treatment technologies. FY 2016 Plans: Will validate computational tools to predict the physical and chemical properties and toxicity of insensitive munitions to assess hazard potentials and health effects of insensitive munitions. Will mature predictive models and computational tools to assess surface water characterization and contaminate potential in austere environments.					
Title: Risk Prediction and Decision Technologies Description: The goal of this effort is to develop and provide integrated science and technology solutions to Army environmental challenges with a focus on acquisition lifecycle models to predict environmental attributes of emerging chemicals and materials that will proactively minimize impacts to the mission and to the Soldier. FY 2014 Accomplishments: Applied climate models, under site level simulation frameworks, to validate web-based visualization tools that provide a framework for assessing multi-stressor impacts due to predictive climatic changes; demonstrated appropriate protocols for generating/parameterizing environmental risk data and parameterization for modifying existing life-cycle analysis of munitions constituents. FY 2015 Plans: Develop and demonstrate appropriate data, scenarios, and processes necessary for conducting the life cycle analysis of the antimony (Sb) containing small arms formulations, and for new insensitive munitions formulations, IMX 101 and 104. Economic life cycle assessments provide scientifically defensible approaches for determining environment risk, and increase confidence in anticipating product impact with respect to environmental regulatory requirements when fielding. FY 2016 Plans:			2.125	1.924	1.471

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Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>	Project (Number/Name) 03E / <i>Environmental Restoration Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2014	FY 2015
Will mature experimental protocols and characterization factors in new small arms formulations for environmental risk determination; will mature and demonstrate software for interpreting life cycle impact assessment calculations using decision support tools.			
Accomplishments/Planned Programs Subtotals		6.700	5.960
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			
E. Performance Metrics N/A			

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Appropriation/Budget Activity 2040 / 3					R-1 Program Element (Number/Name) PE 0603728A / <i>Environmental Quality Technology Demonstrations</i>				Project (Number/Name) 03F / <i>Environmental Quality Tech Demonstrations (CA)</i>			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
03F: <i>Environmental Quality Tech Demonstrations (CA)</i>	-	-	2.250	-	-	-	-	-	-	-	-	-
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 2014	FY 2015			
Congressional Add: Program Increase								-	2.250			
FY 2015 Plans: Program increase												
Congressional Adds Subtotals								-	2.250			
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												
D. Acquisition Strategy N/A												
E. Performance Metrics N/A												