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**Department of Defense  
Fiscal Year (FY) 2018 Budget Estimates**

May 2017



**Chemical and Biological Defense Program**

*Defense-Wide Justification Book Volume 4 of 4*

***Research, Development, Test & Evaluation, Defense-Wide***

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Chemical and Biological Defense Program • Budget Estimates FY 2018 • RDT&E Program

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## Chemical Biological Defense Program Overview

Chemical, biological, radiological, and nuclear (CBRN) threats are dynamic and ever-expanding. The rapid advancement and global proliferation of chemical and biological (CB) capabilities greatly extends the spectrum of plausible actors, agents, concepts of use, and targets. These advances enable States to develop unique CB threats with the intent of circumventing our current defenses, while simultaneously permitting non-State actors to pursue less sophisticated CB threats. To ensure an effective response to these threats, the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP) continuously and actively develops CBRN defensive capabilities to stay ahead of evolving threats. This 2018 budget request includes \$1.37 billion to allocate against valid capability requirements to achieve a strategy-driven balance of risk in accordance with National Defense Strategies, departmental-level objectives, and Service force development priorities.

### Strategic Overview

The CBDP strategic direction reflects current defense policy set by public law, national strategies, DoD Directives and Instructions, and senior leadership guidance. The CBDP mission is to enable the Warfighter to deter, prevent, protect, mitigate, respond, and recover from CBRN threats and effects as part of a layered, integrated defense. This mission aligns with the DoD Strategy for Countering Weapons of Mass Destruction (CWMD), which outlines the elements and enablers of the Department's approach for countering CWMD. CBDP efforts support the continuous cycle of preparing, principally through investments that: "ensure staff expertise; and sustain the Department's science and technology, research and development, and acquisition competencies." CBDP executes its responsibility in support of the Department's strategic approach and provides capabilities supporting the three CWMD strategic lines of effort. These lines of effort are:

- 1) ***Prevent Acquisition*** focuses on ensuring that those not possessing WMD do not obtain them. One of the primary methods of increasing barriers to acquisition and proliferation of WMD will be through pathway defeat—activities focusing on the specific nodes and linkages in an adversary's WMD pathway.
- 2) ***Contain and Reduce Threats*** focuses on reducing risks posed by extant WMD. DoD will remain prepared to lead or support operations to locate, characterize, secure, exploit, and destroy WMD in a range of contingency environments and under varying security and political conditions.

3) ***Respond to Crises*** focuses on activities and operations to manage and resolve complex WMD crises. DoD will assume that hostile non-state actors who acquire WMD or material of concern will plan to use them, and the Department will react accordingly. DoD will be prepared to avoid or defeat WMD attacks and mitigate their immediate effects so as to allow effective operations to continue.

The CBDP supports these lines of effort through materiel and non-materiel capabilities that are interoperable within the Joint Forces and other DoD and United States Government partners countering WMD. The CBDP budget request reflects efforts to balance the dynamic tensions of budget, threat, and scientific development to provide a program that is agile and flexible so as to rapidly adapt to the evolving strategic landscape.

### **Strategic Objectives**

This budget request supports the DoD Strategy for CWMD and advances the following CBDP strategic objectives:

- **Early Warning** - Develop advanced environmental surveillance and point-of-need diagnostic capabilities against CBRN threats, enabling the Warfighter to achieve information dominance in the CBRN domain and enabling rapid force protection decisions.
  - Biosurveillance – The CBDP is developing pre- and post-event capabilities to improve early warning and characterization of man-made and naturally occurring hazards in near real-time. Persistent surveillance will provide early indications and support effective consequence management of the emergence and re-emergence of infectious diseases, genetically engineered and synthetic biological agents, as well as chemical hazards.
  - Advanced Diagnostics – The CBDP resources a robust portfolio of CBR diagnostics that includes S&T, systems development, and procurement of point-of-need/point-of-care diagnostic equipment. Continuous assay development and procurement support fielded and developmental diagnostic and analytic platforms.
- **Avoid, Prevent and Prepare for Surprise** - Advancements in biology and chemistry as well as natural evolution can result in new CB agents and new threats the Warfighter must be prepared to counter. The CBDP identifies and studies such CB agents to scientifically characterize and validate the hazard they could pose to the Warfighter. The CBDP is committed to addressing surprise, both to avoid its occurrence and to rapidly mitigate its consequences. The enterprise aims to leverage cross-domain efforts, information, and assessments to manage surprise through scientific breakthrough, rapid fielding, and operational innovation. Focus areas include:



- Non-Traditional Agents (NTA) – The CBDP is developing technologies that address existing and emerging NTAs to address multiple capability gaps and provide multi-layered and integrated defenses. Enhanced warning, protection, and countermeasures save lives and enable more flexible consequence management.
- Synthetic Biology – Rapid advances in biotechnology open a broad range of potential new challenges from genetically engineered organisms. Rapid characterization of new threats and development of countermeasures remain hallmarks of the CBDP portfolio.
- Integrated, Layered Defense - The CBDP invests strategically in a set of distinct and complementary capabilities to defend against CBRN threats. Collectively, CBDP solutions are comprehensive and address the spectrum and time evolution of CBRN events. These solutions enable the Joint Force to maintain freedom of action in a CBRN environment and enable mission accomplishment.
  - Medical Countermeasures – Development of advanced vaccines, therapeutic drugs, and diagnostic capabilities that provide safe and effective medical defense against validated biological threat agents (bacteria, toxins, and viruses), emerging infectious disease, and traditional and non-traditional chemical agents.
  - Personal Protective Equipment and Collective Protection – Advances in materials and systems engineering will enhance the protective properties against a broader array of threats while reducing heat and logistical burdens. Modular and customizable solutions will be effective against a broad range of challenges and demonstrate applicability in varied environments.
  - Detectors and Sensors – The CBDP is developing the next generation of suitable, effective, and affordable broad-spectrum CB detection capabilities to detect current and emerging CB hazards. Development efforts focus on increasing accuracy, range, and effectiveness and ensuring that detector and sensor data integrate seamlessly with relevant information systems.
  - Hazard Mitigation – Efforts will address personnel decontamination, to include mass casualties and human remains, along with materiel decontamination, which includes sensitive electronics and aircraft. Novel decontamination approaches are focusing on broad applicability to chemicals or biologicals, while minimizing harm to individuals, sensitive equipment, and platforms.

### **FY18 Budget Request Highlights**

- The FY 2018 Research, Development, Test and Evaluation (RDT&E) budget request of \$1097 million (M) supports key efforts including:
  - \$285 million to continue support of research and development of medical countermeasures (MCMs) vaccines and therapeutics addressing high priority biological threats.
  - \$295 million supporting RDT&E efforts advancing environmental (detectors and sensors) and medical surveillance (diagnostic and analytical devices) capabilities providing enhanced situational awareness of traditional and non-traditional chemical threats as well as traditional and emerging biological threats.
  - \$104 million to continue support of research and development of medical countermeasures focused on protecting and treating against traditional and non-traditional chemical agents.
  - \$93 million to support critical chemical and biological defense research, development, and test infrastructure and operations.
  - \$91 million supporting biosurveillance, warning & reporting, decision support, and modeling and simulation capabilities.
  - \$86 million supporting RDT&E for personnel/collective protection and hazard mitigation capabilities against traditional and non-traditional chemical threats as well as traditional and emerging biological threats.
  - \$69 million supporting basic research and threat agent sciences advancing fundamental knowledge and experimental research in the life and physical sciences.
  - \$26 million supporting concepts development, technology demonstrations, and experimentation capability demonstrations to demonstrate enhanced military operational capability for technologies and equipment.
  
- The FY 2018 Procurement budget request of \$275 million supports key efforts including:
  - \$94 million to procure CBRN Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) which allows warfighters to perform CBRN dismounted reconnaissance, surveillance, and site assessment of WMD suspect areas not accessible by traditional CBRN reconnaissance mounted platforms.
  - \$85 million to procure modernized respiratory and ocular protection for ground and air forces.
  - \$27 million to procure modernized Collective Protection capabilities (Joint Expeditionary Collective Protection and CB Protective Shelters).
  - \$16 million to procure Common Analytical Laboratory Systems providing a modular, scalable and adaptable analytical capability for a variety of operating and environmental conditions.
  - \$11 million to procure the CBRN Uniform Integrated Protection Ensemble supporting enhanced protection for special purpose units.

## **Summary**

The proliferation of WMD is among the greatest challenges facing the United States, and countering WMD is a top priority of the U.S. National Security Strategy. Accordingly, the CBDP continues to focus on developing enhanced levels of flexibility and adaptability to anticipate, identify, and quickly respond to the challenge. Current DoD efforts strengthen and expand capabilities to prevent, protect against, mitigate, respond to, and recover from CBRN threats and effects as part of an integrated, layered defense, as well as improve the Warfighter's ability to find, track, interdict, and eliminate CBRN weapons or emerging threats. These efforts ensure that currently available technologies are produced, procured, and provided swiftly and that cutting-edge technologies are harnessed to provide improved capabilities in the future. This is achieved through developing operationally relevant capabilities for the Warfighter that are complementary and holistically reduce identified risks. The CBDP continues to enhance CBRN readiness to counter known and emerging threats and collaborates with other government agencies to foster exchange of knowledge and coordination of CB defense-related activities. This budget request supports the CBDP as a Joint Force enabler fulfilling the needs of the Warfighters to ensure that they are trained, equipped, and resourced to complete missions in CBRN environments now and in the future, preserving the security and freedom of our nation.

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 FY 2018 President's Budget Request  
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 Total Obligational Authority  
 (Dollars in Thousands)

25 Apr 2017

Appropriation -----	FY 2016	FY 2017	FY 2017	FY 2017	FY 2017	FY 2017
	Base + OCO	PB Request with CR Adj Base	Total PB Requests* with CR Adj Base	PB Request with CR Adj OCO	Total PB Requests* with CR Adj OCO	Less Enacted Div B P.L.114-254** OCO
Research, Development, Test & Eval, DW	978,327	884,989	884,989			
Total Research, Development, Test & Evaluation	978,327	884,989	884,989			

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Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Research, Development, Test & Eval, DW	884,989	884,989		884,989	1,095,642		1,095,642
Total Research, Development, Test & Evaluation	884,989	884,989		884,989	1,095,642		1,095,642

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Summary Recap of Budget Activities							
Basic Research	46,856	44,800	44,800				
Applied Research	202,112	188,715	188,715				
Advanced Technology Development	134,070	127,941	127,941				
Advanced Component Development And Prototypes	171,117	138,187	138,187				
System Development And Demonstration	276,560	266,231	266,231				
Management Support	119,334	85,754	85,754				
Operational System Development	28,278	33,361	33,361				
Total Research, Development, Test & Evaluation	978,327	884,989	884,989				
Summary Recap of FYDP Programs							
Research and Development	978,327	884,989	884,989				
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-----							
Summary Recap of Budget Activities							
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Basic Research	44,800	44,800		44,800	43,898		43,898
Applied Research	188,715	188,715		188,715	201,053		201,053
Advanced Technology Development	127,941	127,941		127,941	145,359		145,359
Advanced Component Development And Prototypes	138,187	138,187		138,187	148,518		148,518
System Development And Demonstration	266,231	266,231		266,231	406,789		406,789
Management Support	85,754	85,754		85,754	104,348		104,348
Operational System Development	33,361	33,361		33,361	45,677		45,677
Total Research, Development, Test & Evaluation	884,989	884,989		884,989	1,095,642		1,095,642
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Chemical and Biological Defense Program	978,327	884,989	884,989				
Total Research, Development, Test & Evaluation	978,327	884,989	884,989				

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Chemical and Biological Defense Program	884,989	884,989		884,989	1,095,642		1,095,642
Total Research, Development, Test & Evaluation	884,989	884,989		884,989	1,095,642		1,095,642

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
7	0601384BP	Chemical and Biological Defense Program	01	46,856	44,800	44,800					U
		Basic Research		46,856	44,800	44,800					
15	0602384BP	Chemical and Biological Defense Program	02	202,112	188,715	188,715					U
		Applied Research		202,112	188,715	188,715					
43	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	134,070	127,941	127,941					U
		Advanced Technology Development		134,070	127,941	127,941					
76	0603884BP	Chemical and Biological Defense Program - Dem/Val	04	171,117	138,187	138,187					U
		Advanced Component Development And Prototypes		171,117	138,187	138,187					
120	0604384BP	Chemical and Biological Defense Program - EMD	05	276,560	266,231	266,231					U
		System Development And Demonstration		276,560	266,231	266,231					
152	0605384BP	Chemical and Biological Defense Program	06	100,269	85,754	85,754					U
153	0605502BP	Small Business Innovative Research - Chemical Biological Def	06	19,065							U
		Management Support		119,334	85,754	85,754					
194	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	28,278	33,361	33,361					U
		Operational System Development		28,278	33,361	33,361					
Total Research, Development, Test & Eval, DW				978,327	884,989	884,989					

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7	0601384BP	Chemical and Biological Defense Program	01	44,800	44,800		44,800	43,898		43,898	U
		Basic Research		44,800	44,800		44,800	43,898		43,898	
15	0602384BP	Chemical and Biological Defense Program	02	188,715	188,715		188,715	201,053		201,053	U
		Applied Research		188,715	188,715		188,715	201,053		201,053	
43	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	127,941	127,941		127,941	145,359		145,359	U
		Advanced Technology Development		127,941	127,941		127,941	145,359		145,359	
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120	0604384BP	Chemical and Biological Defense Program - EMD	05	266,231	266,231		266,231	406,789		406,789	U
		System Development And Demonstration		266,231	266,231		266,231	406,789		406,789	
152	0605384BP	Chemical and Biological Defense Program	06	85,754	85,754		85,754	104,348		104,348	U
153	0605502BP	Small Business Innovative Research - Chemical Biological Def	06								U
		Management Support		85,754	85,754		85,754	104,348		104,348	
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<b>Total Research, Development, Test &amp; Eval, DW</b>				<b>884,989</b>	<b>884,989</b>		<b>884,989</b>	<b>1,095,642</b>		<b>1,095,642</b>	

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Appropriation: 0400D Research, Development, Test & Eval, DW

Program Line No	Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Sequence
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152	0605384BP	Chemical and Biological Defense Program	06	85,754	85,754		85,754	104,348		104,348	U
153	0605502BP	Small Business Innovative Research - Chemical Biological Def	06								U
		Management Support		85,754	85,754		85,754	104,348		104,348	
194	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	33,361	33,361		33,361	45,677		45,677	U
		Operational System Development		33,361	33,361		33,361	45,677		45,677	
<b>Total Chemical and Biological Defense Program</b>				<b>884,989</b>	<b>884,989</b>		<b>884,989</b>	<b>1,095,642</b>		<b>1,095,642</b>	

R-1C1F: FY 2018 President's Budget Request (Published Version), as of April 25, 2017 at 09:10:41



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<b>Line #</b>	<b>Budget Activity</b>	<b>Program Element Number</b>	<b>Program Element Title</b>	<b>Page</b>
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153	06	0605502BP	SMALL BUSINESS INNOVATIVE RESEARCH (SBIR).....	Volume 4 - 307

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<b>Line #</b>	<b>Budget Activity</b>	<b>Program Element Number</b>	<b>Program Element Title</b>	<b>Page</b>
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**Master Program Element Table of Contents (Alphabetically by Program Element Title)**

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CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	0605384BP	152	06.....	Volume 4 - 287
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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> / BA 1: <i>Basic Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	46.856	44.800	43.898	-	43.898	43.004	46.107	46.226	46.220	Continuing	Continuing
LF1: <i>CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)</i>	-	27.262	29.376	27.996	-	27.996	27.389	30.301	30.377	30.373	Continuing	Continuing
PS1: <i>CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)</i>	-	19.594	15.424	15.902	-	15.902	15.615	15.806	15.849	15.847	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Advances fundamental knowledge and promotes theoretical and experimental research in life and physical sciences.

The projects within this BA reflect the research areas of Life Sciences (LF1) (e.g. microbiology, biochemistry, pathogenic mechanisms, cell and molecular biology, immunology, nanoscale science, and information science) which focus on fundamental efforts to understand living systems' response to biological or chemical agents, to support detection, diagnostics, protection, and medical treatment.

The projects within this BA also include efforts in Physical Sciences (PS1) (e.g. chemistry, physics, materials science, nanotechnologies, nanoscale science, and environmental science) which focus on fundamental scientific phenomena. These support investigation of physical and chemical properties and interactions for enhanced functionalities important to detection, diagnostics, protection, and decontamination.

BA1 also supports the DoD Science, Technology, Engineering, and Math (STEM) Strategy Plan to attract, inspire, and develop exceptional STEM talent across the education continuum to enrich our current and future DoD workforce to meet defense technological challenges. This includes the Joint Science and Technology Institute (JSTI) which is a 2-week residential program for high school students and teachers who conduct a research project from a STEM field with a DoD scientist. In addition, the National Research Council Research Associateship Program and the Military Internship Program provide unique opportunities for talented scientists and engineers, and promising midshipmen/cadets, to conduct research at DoD service laboratories on projects that are of interest to the Chemical and Biological Defense Program Enterprise in an effort to develop the future DoD workforce.

The projects in this PE are placed in BA1 because they are basic research efforts directed towards non-specific or non-unique military applications. Basic research technological breakthroughs support applied research (PE 0602384BP) activities.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: FY 2018 Chemical and Biological Defense Program</b>	<b>Date: May 2017</b>
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> / BA 1: <i>Basic Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	47.761	44.800	44.311	-	44.311
Current President's Budget	46.856	44.800	43.898	-	43.898
Total Adjustments	-0.905	0.000	-0.413	-	-0.413
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.905	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-0.413	-	-0.413

**Change Summary Explanation**

Funding: N/A

Schedule: N/A

Technical: N/A



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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 1	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	<b>Project (Number/Name)</b> LF1 / CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
LF1: CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)	-	27.262	29.376	27.996	-	27.996	27.389	30.301	30.377	30.373	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project (LF1) focuses on fundamental efforts to understand living systems' responses to biological or chemical agents, to support detection, protection, diagnostics, and medical treatment. Research focuses on understanding factors which influence the behavior of chemicals, toxins, and pathogens in relation to the host or target. Understanding of host/agent interactions can drive exploration of novel approaches to detect, diagnose or protect against threats. Research also focuses on medical countermeasures for improved efficacy against a wide array of current and future threat agents.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) Life Sciences</p> <p><b>Description:</b> Focuses on fundamental efforts to understand living systems' responses to biological or chemical agents, to support detection, protection, diagnostics, and medical treatment.</p> <p><b>FY 2016 Accomplishments:</b> Continued efforts to understand pathogens, novel threats and host responses. Completed genetic sequencing of a species of bats and identified novel pathways in non-human primates (NHP) and human microphage cell lines that enable filovirus infections. Continued to investigate and evaluate systemic biological responses following exposure of living systems to CB agents. Improved understanding of how polymicrobial interactions interfere with bacterial activities to influence discovery of novel antagonists for medical countermeasures. Continued to explore nano-structured materials as approaches to the needs of chemical and biological countermeasures, including behavior in biological systems and how morphology relates to biological interaction and function. Continued evaluation of the role of gene amplification and duplication in the development of multiple drug resistance in bacterial pathogens. Continued consortium approach to explore the importance of bacterial persistence and antibiotic tolerance, successfully grew mutants in vitro for understanding various resistance mechanisms. Continued to investigate the influence of glycosylation patterns on biologic stability and pharmacologic characteristics. Developed new understanding of the interaction of the blood-brain barrier with chemical and biological agent simulants and identified new brain-specific antibodies with the potential to serve as countermeasure delivery platforms. Exploited key features of natural toxin leader segments in a proof-of-concept of a new class of toxin blockers capable of dramatically reducing the translocation of exotoxin.</p> <p><b>FY 2017 Plans:</b> Continue efforts to understand pathogens, novel threats, and host responses (including human and zoonotic) to prevent/minimize host injury. Continue to investigate and evaluate systemic biological responses following exposure of living systems to CB</p>	27.262	29.376	27.996

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 1	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	<b>Project (Number/Name)</b> LF1 / CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>agents. Improve understanding of how polymicrobial interactions interfere with bacterial activities to influence discovery of novel antagonists for medical countermeasures. Continue to explore nano- and nano-structured materials as approaches to the needs of chemical and biological countermeasures, including behavior in biological systems and how morphology relates to biological interaction and function. Continue to evaluate various global processes and mechanisms which lead to bacterial persistence and resistance. Identify biomarkers indicative of resistance and persistence. Investigate novel therapeutics developed and collected from novel sources. Investigate the influence of glycosylation patterns on biologic stability and pharmacologic characteristics. Continue evaluation of role of gene amplification and duplication in the development of multiple drug resistance in bacterial pathogens. Investigate alpha-virus glycoprotein tertiary structure and other viral immunodominant epitopes for improved development of immune assays, which will support identification of an immune correlate of protection for vaccine licensure. Examine mucosal immunity, particularly in the lung, for future development of mucosal vaccines. Investigate new transport mechanisms of the blood-brain barrier, including specific interactions regulating viral entry into the central nervous system. Investigate new biomarkers accessible in a minimally-invasive manner, characteristic of CB threats and the development of antimicrobial resistance.</p> <p><b>FY 2018 Plans:</b> Continue efforts to understand pathogens, novel threats, and host responses (including human and zoonotic) to prevent/minimize host injury. Complete, test, and validate primers and probes for filovirus animal model and develop in vitro and in vivo inflammatory response models. Continue to develop robust genetic control architectures for guidance of antimicrobials against bio threats. Evaluate gut-on-a-chip devices for diagnostic capability and build capacity for multiple pathogens. Validate nano-structured material drug delivery in various tissues and measure bio-distribution for optimal therapeutic delivery. Conduct in vivo validation against agent challenge to demonstrate proof of concept. Continue evaluation of role of gene amplification and duplication in the development of multiple drug resistance in bacterial pathogens. Replicate environmental factors of persistence and validate mechanism against animal models. Continue to investigate the influence of glycosylation patterns on biologic stability and begin pharmacokinetic and immunogenicity studies to validate animal model efficacy. Continue to investigate filovirus glycoprotein tertiary structure and other viral immunodominant epitopes for improved development of immune assays which will support identification of an immune correlate of protection for vaccine licensure. Begin validation of in silico transport mechanisms of the blood-brain barrier studies, in vitro, and in vivo to screen for potential therapeutic targets. Evaluate gene duplication and amplification as a specific mechanism for antimicrobial resistance and horizontal gene transfer. Begin development of a gene amplification detection system that can identify changes in antimicrobial and multidrug resistance. Investigate novel inhibitory mechanisms that circumvent efflux pumps. Explore the application of microfluidics to examine the host-immune response in the microenvironment and biomarker discover for infection onset and response to therapy. Examine the impact of modulated olfactory, respiratory, and alveolar molecular &amp; cell population variation on uptake of inhaled particulates, progression of toxicological &amp; pathogenic effects.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	27.262	29.376	27.996

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>		<b>Date: May 2017</b>
<b>Appropriation/Budget Activity</b> 0400 / 1	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	<b>Project (Number/Name)</b> LF1 / CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB2: CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)	50.049	56.191	71.654	-	71.654	68.631	68.636	68.816	68.806	Continuing	Continuing
• NT2: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)	65.810	64.476	56.187	-	56.187	54.223	53.421	50.594	52.883	Continuing	Continuing
• TM2: TECHBASE MED DEFENSE (APPLIED RESEARCH)	86.253	68.048	73.212	-	73.212	71.624	73.597	79.610	81.898	Continuing	Continuing
• CB3: CHEMICAL BIOLOGICAL DEFENSE (ATD)	17.141	19.109	18.093	-	18.093	21.835	21.790	21.837	21.835	Continuing	Continuing
• NT3: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)	20.633	17.173	23.655	-	23.655	22.893	24.347	30.490	31.291	Continuing	Continuing
• TM3: TECHBASE MED DEFENSE (ATD)	89.090	83.838	92.846	-	92.846	88.809	93.823	104.821	104.255	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 1					<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)				<b>Project (Number/Name)</b> PS1 / CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
PS1: CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)	-	19.594	15.424	15.902	-	15.902	15.615	15.806	15.849	15.847	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This project (PS1) advances fundamental scientific knowledge in physical science areas that include chemistry, physics, materials science, environmental sciences, and nanotechnology that could potentially lead to transformational CB defensive capabilities enhancing Warfighter performance and safety. Research results in physics, chemistry, and materials sciences that have potential application in point and standoff detection, diagnostics, as well as protection and decontamination. Surface and environmental sciences focus on the study of physical and chemical properties and phenomena of interactions, especially with regard to Non Traditional Agents (NTAs), that seek to improve capabilities such as detection, protection, and decontamination. Research in nanotechnology and nanoscale sciences, such as nanoelectromechanical systems, molecular motors, nano-mechanical resonance sensing, and nano-meter imaging, has potential application across CB capability areas to provide significant enhancement by, for example, decreasing detection response times, increasing medical countermeasure effectiveness against a wider array of threat agents, and providing currently unavailable modalities like detection imbedded in fabrics.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) Physical Sciences	19.594	15.424	15.902
<b>Description:</b> Focuses on fundamental scientific phenomena including chemistry, physics, materials science, environmental science, and nanotechnology.			
<b>FY 2016 Accomplishments:</b> Continued exploring multifunctional material design and synthesis to identify dynamic materials that combine functionality and durability to improve CB protection by increasing protection factors and reducing physical burden. Designed and synthesized novel decontamination options that are broadly applicable to multiple chemicals or biologicals and are less harmful to equipment. Continued exploration of micro-, nano- and nanostructured materials as novel approaches to needs in chemical and biological countermeasures. Explored materials and integration of functionality that may provide adaptive materials and capabilities for CB defense countermeasures that bind, catalyze, respond to and/or mitigate threats. Continued to investigate impact of ambient surface reactivity and structure on the performance of state-of-the-art and novel CB mitigating materials. Developed new understanding of the fabrication and effect of dynamic chemical gradients on molecular transport to improve detection sensitivity.			
<b>FY 2017 Plans:</b> Continue to examine the impact of processing parameters in designing large scale membranes, which respond to multiple CB threats via deactivation and confirmation change to enable novel means of protection and minimization of thermal burden. Continue designing and synthesizing novel decontamination options that are broadly applicable to multiple chemicals or			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 1	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	<b>Project (Number/Name)</b> PS1 / CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>biologicals and are less harmful to equipment. Continue to investigate the impact of morphology on approaches to mitigate chemical and biological threats on CB relevant substrates - such as fibers and yarns. Continue exploring materials and integration of functionality that may provide adaptive materials and capabilities for CB defense countermeasures that bind, catalyze, respond and/or mitigate threats. Continue to study fundamental mechanisms between CB threats and surfaces at ambient pressure in order to elucidate its impact on reaction mechanisms between CB threats and state-of-the-art and novel CB mitigating surfaces.</p> <p><b>FY 2018 Plans:</b> Continue to examine the impact of processing parameters in designing large scale membranes, which respond to multiple CB threats via deactivation and conformation change to enable novel means of protection and minimization of thermal burden. Continue designing and synthesizing novel decontamination options that are broadly applicable to multiple chemicals or biologicals and are less harmful to equipment. Continue to investigate the impact of morphology on approaches to mitigate chemical and biological threats on CB relevant substrates - such as fibers and yarns. Continue to investigate the impact of composition on structure and activity of materials to mitigate chemical and biological threats on CB relevant substrates. Continue to study fundamental mechanisms between CB threats and surfaces at ambient pressure in order to elucidate its impact on reaction mechanisms between CB threats and state-of-the-art and novel CB mitigating surfaces. Continue investigation of ecological and environmental drivers of Burkholderia pseudomallei virulence and persistence using multiplexed barcoded high throughput sequencing. Continue to examine biomarkers from interstitial fluid and begin microneedle biosensor development to identify protein analytes. Optimize catalytic polyelectrolyte and metal organic framework structures for hydrolysis or oxidation of toxic agents. Evaluate and model self-decontaminating catalytic properties of materials for further testing against real agents. Continue to assess and evaluate the efficacy of short chain fatty acids as a means of inactivating B. anthracis vegetative cells, endospores, and other microorganisms under a variety of environmental conditions and surfaces. Continue to investigate the elementary reactions, fundamental process parameters, and material mechanisms of a new means of neutralizing chemical warfare agents using a single-step, continuous supercritical water oxidation platform.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	19.594	15.424	15.902

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB2: CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)	50.049	56.191	71.654	-	71.654	68.631	68.636	68.816	68.806	Continuing	Continuing
• NT2: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)	65.810	64.476	56.187	-	56.187	54.223	53.421	50.594	52.883	Continuing	Continuing

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**Exhibit R-2A, RDT&E Project Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 1	<b>R-1 Program Element (Number/Name)</b> PE 0601384BP / CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	<b>Project (Number/Name)</b> PS1 / CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TM2: TECHBASE MED DEFENSE (APPLIED RESEARCH)	86.253	68.048	73.212	-	73.212	71.624	73.597	79.610	81.898	Continuing	Continuing
• CB3: CHEMICAL BIOLOGICAL DEFENSE (ATD)	17.141	19.109	18.093	-	18.093	21.835	21.790	21.837	21.835	Continuing	Continuing
• NT3: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)	20.633	17.173	23.655	-	23.655	22.893	24.347	30.490	31.291	Continuing	Continuing
• TM3: TECHBASE MED DEFENSE (ATD)	89.090	83.838	92.846	-	92.846	88.809	93.823	104.821	104.255	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 2: Applied Research</i>					<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	202.112	188.715	201.053	-	201.053	194.578	195.454	196.820	196.787	Continuing	Continuing
CB2: <i>CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)</i>	-	50.049	56.191	71.654	-	71.654	67.381	67.386	67.566	67.556	Continuing	Continuing
NT2: <i>TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)</i>	-	65.810	64.476	56.187	-	56.187	54.223	54.721	52.894	52.883	Continuing	Continuing
TM2: <i>TECHBASE MED DEFENSE (APPLIED RESEARCH)</i>	-	86.253	68.048	73.212	-	73.212	72.974	73.347	76.360	76.348	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Applied research in the areas of physical technologies (CB protective materials, textiles, and filtration, sensors and sensing algorithms, effects modeling, chemical formulations, processes, and methods for hazard mitigation), medical technologies (drug discovery and platform technology development, biomarkers and assay development useful in drug development and diagnostics, human mimicking devices and regulatory science), and non-traditional agent medical and physical defense technologies, including characterization of emerging threats. Major efforts support development of vaccines, therapeutics, next generation diagnostics systems, next generation chemical detectors, nerve agent pretreatments, and individual protection advances.

In the physical sciences area, Project CB2, focuses on continuing improvements in CB defense materiel, including contamination avoidance, decontamination, and protection technologies, as well as biological weapon/agent surveillance.

For Non-Traditional Agents (NTAs), Project NT2 consolidates all NTA efforts (both medical and non-medical) including pretreatments, therapeutics, detection, threat agent science, modeling, and protection and hazard mitigation.

The medical program, Project TM2, focuses on the development of antidotes, drug treatments, disease surveillance and point-of-need diagnostic devices, patient decontamination and medical technologies management.

One function of the CBDP S&T Applied Research budget is to preserve critical core competencies in the DoD Service laboratories which includes: United States Army Edgewood Chemical Biological Center (ECBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL),

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 2: Applied Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)</i>
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among others. The intent is to maintain strategic partnerships with the DoD Service communities for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

Efforts under this PE will transition to or will provide risk reduction for Advanced Technology Development (PE: 0603384BP), Advanced Component Development and Prototypes (PE: 0603884BP), and System Development and Demonstration (PE: 0604384BP).

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	202.611	188.715	206.855	-	206.855
Current President's Budget	202.112	188.715	201.053	-	201.053
Total Adjustments	-0.499	0.000	-5.802	-	-5.802
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.499	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-5.802	-	-5.802

**Change Summary Explanation**

Funding: N/A

Schedule: N/A

Technical: N/A



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2					<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)				<b>Project (Number/Name)</b> CB2 / CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CB2: CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)	-	50.049	56.191	71.654	-	71.654	67.381	67.386	67.566	67.556	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project CB2 provides physical science applied research to develop future, multi-disciplinary, and multi-functional capabilities in life sciences, physical sciences, environmental sciences, mathematics, cognitive sciences, and engineering. Efforts in this project support the seamless integration of state-of-the-art-technologies into a collection of systems across the spectrum of capabilities required to support chemical and biological defense missions. Capability areas in this project include: protection/hazard mitigation; detection; information systems technology; and threat agent science. Protection and hazard mitigation focuses on providing technologies that protect from and reduce the impact of chemical/biological threat or hazard to the Warfighter, weapons platforms, and structures. Detection focuses on developing technologies for standoff and point detection and identification of chemical and biological agents. Information systems technology focuses on advanced hazard prediction, operational effects and risk assessment, and systems performance modeling. Threat agent science is devoted to characterizing threat agents and the hazards they present in terms of agent fate in the environment, toxicology, and pathogenicity, and focuses on the horizontal integration of CB defensive technologies in support of the Joint Services.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) Material Contamination Mitigation	3.294	2.975	3.171
<b>Description:</b> Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort.			
<b>FY 2016 Accomplishments:</b>			
Completed Point-of-Use Formulation (previously named Dial a Decon) effort and transitioned data to the JPM-P Joint General Purpose Decontaminant - Hardened Military Equipment program of record. Completed predictive optimization of decontaminant dispensing parameters effort and transitioned data to the Joint General Purpose Decontaminant - Hardened Military Equipment program of record. Continued hot air biological decontamination effort to address sensitive equipment, platform interior, and aircraft decontamination needs, focusing on viral and vegetative bacterial efficacy and using a germinant to reduce the time needed to kill bacterial spores. Continued the effort using zirconium hydroxide (Zr(OH)4) to meet warfighter immediate and operational decontamination needs, focusing on large panel efficacy testing. Initiated chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft chemical warfare agent decontaminant needs. Completed new methodology development for chemical agent resistant coating (CARC) assessment and transitioned the data to the CARC Commodity Manager. Continued responsive and resistant coatings efforts to enhance decontaminability as part of the systems approach to achieving efficacy goals. Continued Wide Area Decontamination of Bacillus anthracis projects. Continued surface			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> CB2 / CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>science investigations to inform design for the development of the next generation of hazard mitigation technologies to achieve toxicology-based efficacy goals.</p> <p><b>FY 2017 Plans:</b> Transition sorbent decontaminant formulation effort to advanced development for immediate decontamination to leverage emerging technologies and data that demonstrates significantly greater efficacy if decontamination process is initiated within the first hour. Initiate room temperature ionic liquid decontaminant effort to address sensitive equipment decontaminant need (enzyme and catalytic) projects. Continue application of data gathered from surface science investigations to inform design to initiate development of the next generation of hazard mitigation technologies that include integration of multiple systems to achieve efficacy goals. Continue enhanced CB survivability and responsive coatings projects to enhance decontaminability as part of the systems approach to achieving efficacy goals. Demonstrate the wide-area decontamination hazard mitigation effort, which focuses on biological spore decontamination in a representative outdoor environment.</p> <p><b>FY 2018 Plans:</b> Complete agent resistant coatings effort and transition to the Air Force Item manager. Continue chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft chemical warfare agent decontaminant needs. Continue responsive coatings efforts to enhance decontaminability as part of the systems approach to achieving efficacy goals. Continue Wide Area Decontamination of Bacillus anthracis projects, focusing on agrochemical approaches. Continue surface science investigations with expanded set of materials, parameters and agents to inform design for the development of the next generation of hazard mitigation technologies to achieve toxicology-based efficacy goals. Continue elimination/bulk chemical warfare agent destruction effort, focusing on neutralization and polymerization of bulk chemical warfare agents. Continue effort to examine how decontamination technologies perform on field assets when contaminated with other than CASARM (laboratory quality/pure) chemical agents. Continue efforts to develop/enhance agent mapping (disclosure/assurance) technologies.</p>				
<p><b>Title:</b> 2) Respiratory and Ocular Protection</p> <p><b>Description:</b> Development and integration of novel filtration media into a lightweight, low-profile, and low-burden individual protective filter, which has enhanced performance against a broader range of challenges that includes toxic industrial chemicals (TICs).</p> <p><b>FY 2016 Accomplishments:</b> Continued efforts to develop novel filtration media in a lightweight, low-profile, and low-burden individual protective filter. Developed components of a hybrid respirator that includes nanotechnologies, anti-fogging materials, dynamic response breathing, oxygen storage, and CO2 scrubbing.</p> <p><b>FY 2017 Plans:</b></p>		2.778	3.698	3.113

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Continue to develop components of a hybrid respirator that can scale between different challenge environments. Components include nanotechnologies, anti-fogging materials, dynamic response breathing, oxygen storage and CO2 scrubbing.</p> <p><b>FY 2018 Plans:</b> Continue novel filtration efforts and develop respirator-helmet integration technologies. Continue closed circuit Self Contained Breathing Apparatus (SCBA) development, and portable integrated air management systems. Initiate multifunctional systems in relevant configurations at scale for respiratory and ocular protection.</p>				
<p><b>Title:</b> 3) Percutaneous Protection</p> <p><b>Description:</b> Develop advanced ensemble prototypes with state-of-the art materials that address the full spectrum of threats and provide a range of solutions optimized for protection, thermal comfort, and mission performance.</p> <p><b>FY 2016 Accomplishments:</b> Continue efforts to enhance both force protection and situational awareness through the improvement of multi-functional materials that exhibit broad-reaching, cross-cutting capabilities in chemical/biological sensing and detoxification. Validated response mechanisms of dynamic multi-functional materials that conform to the threat challenge amount.</p> <p><b>FY 2017 Plans:</b> Engineer mixed matrix membranes with increased moisture permeability and selectivity against CB threats. Incorporate metal-organic/metal oxide constructs into these membranes to destroy chemical agents. Continue to test reactive metal-organic/ metal-oxide materials with chemical agents and develop deposition strategies to form composite materials. Continue to develop and scale production technologies for novel materials.</p> <p><b>FY 2018 Plans:</b> Continue to develop advanced NFPA certified fully encapsulated ensemble prototypes with state-of-the art materials that address the full spectrum of threats and provide a range of solutions optimized for protection, thermal comfort, and mission performance. Continue to develop composite and novel multi-functional materials and low thermal burden garment materials which provide site-specific CB protection On Demand.</p>		5.369	4.931	6.333
<p><b>Title:</b> 4) Expeditionary Collective Protection</p> <p><b>Description:</b> Develop new technologies for soldiers to determine the remaining chemical vapor service life of their chemical warfare agent (CWA) filters.</p> <p><b>FY 2016 Accomplishments:</b></p>		0.510	1.233	1.343

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Continued efforts to develop Residual Life Indicator (RLI) satellite filter cartridge system by finalizing the component design and begin verification testing of a system that was investigated in a field application for long term exposure in an operationally relevant environment.</p> <p><b>FY 2017 Plans:</b> Analyze and characterize the performance of RLI satellite filter cartridge. Optimize the RLI performance to ensure correlation to that of the carbon bed in a CBRN collective protection filter. Collect data to establish the filter bed performance of the RLI is effectively correlated with Guard Bed (a low profile pre-filter) and the RLI creates an extended filter bed life with Guard Bed.</p> <p><b>FY 2018 Plans:</b> Continue systems integration and surveillance of Guard Bed filters and RLIs. Continue fabrication of the photo luminescent RLI satellite cartridge prototypes.</p>				
<p><b>Title:</b> 5) Personnel Contamination Mitigation</p> <p><b>Description:</b> Develop new technologies to mitigate the risk associated with contaminated human remains and personal effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents.</p> <p><b>FY 2016 Accomplishments:</b> Continued Personnel Decontamination hazard mitigation projects to develop an alternative to reactive skin decontamination lotion (RSDL). Completed the effort to enhance the barrier properties of the Chemical Human Remains Pouch (CHRP) fabric against the permeation of chemical agents using a liner and transitioned to the Contaminated Human Remains System (CHRS) program of record.</p> <p><b>FY 2017 Plans:</b> Continue Personnel Decontamination hazard mitigation projects to develop an alternative to RSDL. Continue mass casualty personnel decontamination projects to develop technology to manage the specific issues (throughput and efficacy) associated with mass casualty decontamination to support warfighter operations, including homeland defense mission.</p> <p><b>FY 2018 Plans:</b> Transition technology data efforts to develop an alternative to RSDL. Initiate personnel decontamination efforts to enhance current processes and support mass casualty personnel decontamination warfighter operations, including homeland defense mission.</p>		0.901	0.673	1.450
<p><b>Title:</b> 6) Biosurveillance (BSV)</p> <p><b>Description:</b> Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact, and biological threat assessment. Contribute to the development of global, near real-</p>		2.893	8.380	9.708

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools.</p> <p><b>FY 2016 Accomplishments:</b> Completed effort to develop a trust filter for next generation data sources to be included in biosurveillance analytic capabilities of the Biosurveillance Ecosystem. Initiated effort to explore next generation device-to-cloud capabilities and possible applications for biosurveillance.</p> <p><b>FY 2017 Plans:</b> Develop technologies (e.g., event-based surveillance and historical baselines; predictive models of plant and/or animal disease; uncertainty quantification) to intelligently fuse ubiquitous sensing capabilities (wearables, field deployed diagnostics and autonomous environmental sensing vehicles). Data fusion technologies were developed in FY16 under BA2 TM2/Diagnostics; readjustment in FY17 more appropriately aligns these activities as biosurveillance efforts. Continue device-to-cloud capabilities effort to reliably transmit sensed data to a secure repository and appropriately feed into disease modeling, medical resource estimation, and decision support tools.</p> <p><b>FY 2018 Plans:</b> Continue to develop technologies aimed at predicting, forecasting and mitigating biosurveillance events (e.g., data gathering and sharing mechanisms for event-based surveillance; compilation of historical baselines; models of plant and/or animal disease spread; social media data analytics, uncertainty quantification). Develop capabilities to intelligently fuse ubiquitous sensing capabilities (wearables, field deployed diagnostics and autonomous environmental sensing vehicles) for earlier warning. Initiate enhanced data visualization capabilities for both sensor data fusion and predictive disease propagation models. Initiate Integrated Early Warning Ecosystem to provide improved Chemical and Biological Defense (CBD) situational awareness, a common analytical work bench for users, integration and fusion of a wide array of relevant data sources, and decision support tools for the tactical to strategic level command authorities. The intent is to leverage advances gained in the Biosurveillance Ecosystem development for application in the wider Integrated Early Warning domain. This effort will be funded out of both CB2 (Chemical Biological Defense)/Biosurveillance and TM2 (Techbase Med Defense)/Biosurveillance. Efforts in this budget will focus on modeling and simulation and innovative data fusion techniques.</p>				
<p><b>Title:</b> 7) Detection</p> <p><b>Description:</b> Emphasis on the detection and identification of chemical and biological threats. Objectives include the development of miniaturized detector for sensing of chemical and biological agents, and design for prototype whole pathogen genome sequencing system.</p> <p><b>FY 2016 Accomplishments:</b></p>		16.109	13.831	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Completed algorithm development to increase range capabilities, reduce false positives, and provide decision capabilities for large data sets. Continued concept and technology development for biological threat early warning detection. Initiated the development of proteomic detection capabilities.</p> <p><b>FY 2017 Plans:</b> Continue concept and technology development for the biological threat early warning detection. Initiate development of sample preparation techniques to enhance environmental detection platforms. Continue high sensitivity immunoassay detection platforms for environmental samples.</p>				
<p><b>Title:</b> 8) Detection Sensor Technologies</p> <p><b>Description:</b> Focus of this budget activity is to develop capabilities to detect and identify chemical and biological threats. This activity can include development of point, remote, or standoff sensors as appropriate, to address both conventional and non-traditional chemical and biological threats. These efforts are being developed to further the detection capability for early warning of exposure to contamination for the warfighter.</p> <p><b>FY 2018 Plans:</b> This program realigns FY17 efforts from CB2 (Chemical Biological Defense)/Detection and NT2 (Techbase Non-Traditional Agents Defense)/Detection. Continue concept and technology development for biological and chemical threat early warning detection. Continue development of sample preparation techniques to enhance environmental detection platforms. Initiate the development of detection capabilities for identifying genomic editing events. Continue development of a man worn environmental sensor for detecting exposure to chemical hazards. Continue the development of proteomic detection capabilities.</p>		-	-	26.051
<p><b>Title:</b> 9) Hazard Prediction</p> <p><b>Description:</b> Improve battlespace awareness by accurately predicting hazardous material releases, atmospheric transport and dispersion, and resulting human effects. Develop capability for predicting the source term of releases of chemical, biological, and industrial materials.</p> <p><b>FY 2016 Accomplishments:</b> Completed development of initial waterborne transport and dispersion models, including advancements to the Incident Command Tool for Drinking Water Protection (ICWater) which models riverine systems, System for Hazard Assessment of Released Chemicals (SHARC) which models coastal/littoral systems, and associated documentation. These models target the Joint Effects Model (JEM) waterborne modeling requirements. Continued development and implementation of solar radiation algorithms to support photo-oxidation kinetics that will enable temporal changes in solar radiation over the course of an incident simulation. Completed field studies to validate waterborne transport and dispersion model capabilities developed in the previous year. Continued interior building transport and dispersion modeling effort to improve modeling of outdoor dispersion from indoor</p>		5.137	5.822	4.648

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>release and modeling of indoor dispersion in multiple buildings from an outdoor release, simulating wide-area effects of a release in an urban environment. Completed high-resolution and probabilistic meteorology research, incremental numerical weather prediction system upgrades, and provided operational support for the Environmental Data Enterprise (EDE). Initiated work to optimize the urban subsystem modeling capability and increased the fidelity of source term estimation in urban environments. Continued development of MicroSWIFT/SPRAY (MSS) to improve hazard prediction in urban environments in Hazard Prediction and Assessment Capability (HPAC) including completing parallelization and validation of a fast, parallel momentum solver for incorporation into Parallel SWIFT. Completed improvements and validation for a SPRAY dense gas model. Initiated development of a liquid pool model within MSS. Continued advancing the urban modeling capability and optimizing the urban sub-system for interfacing transport models of varying fidelity and speed. Continued research and development to enhance the fidelity of the missile intercept modeling capability within the HPAC by developing architecture and interface specifications required to address existing gaps in intercept model capability.</p> <p><b>FY 2017 Plans:</b> Continue development of waterborne transport and dispersion models, including advancements to the ICWater and SHARC. Leverage new data sources for higher resolution land-use, bathymetric and oceanographic data. Continue related field studies to validate waterborne transport and dispersion model outputs. Continue interior building transport and dispersion modeling effort to improve modeling of outdoor dispersion from indoor release and modeling of indoor dispersion in multiple buildings from an outdoor release, simulating wide-area effects of a release in an urban environment. Continue work to optimize the urban subsystem modeling capability and develop capability to perform linked Bayesian probability analysis and increase the fidelity of source term estimation for urban environments. Continue development of MSS to improve hazard prediction for urban environments in HPAC. Continue research and development to enhance the fidelity of the missile intercept modeling capability within the HPAC. Continue development of a virtual test and evaluation simulation environment for evaluating/stressing source characterization and hazard refinement techniques.</p> <p><b>FY 2018 Plans:</b> Continue development to improve urban subsystem, specifically coupling between indoor and outdoor dispersion models for urban releases and initiate field studies for validation of these capabilities. Begin development and enhancement of source-term estimation/source characterization algorithms. Complete research and development of enhancements to the fidelity of the missile intercept modeling capability within the HPAC. Initiate research and development of advanced weather modeling techniques. Initiate development of enhancements to human response models for CBRN agent and toxic industrial chemical exposures. Continue development of MSS to improve hazard prediction for urban environments in HPAC, including continuing to upgrade the code to meet CCMI compliance and implementing terrain-following dense gas motions. Complete development of a secondary evaporation model. Initiate development of next generation littoral waterborne modeling system.</p>			
<b>Title:</b> 10) Data Analysis	3.527	2.791	3.216

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Develop CBRN data sharing capabilities and simulation tools. Develop chapters of the Chemical and Biological Agent Effects Manual Number 1 (CB-1), an authoritative source capturing analytical methods for evaluating the effects of CB agents on equipment, personnel, and operations. These chapters are developed by a mix of contractors and labs, employing the experts in each subject area.</p> <p><b>FY 2016 Accomplishments:</b> Continued providing access of field trial data sources to transport and dispersion community. Continued to develop additional chapters of the CB-1. Completed drafts of CB-1 Chapter 12 - Human Factors and Chapter 8 - Structures/Site Characteristics. Continued work drafting Chapter 13 - Consequence Assessment and Chapter 15 - Battlespace Management. Began work on Chapter 18 - Material Effects and Chapter 20 - Risk Assessment.</p> <p><b>FY 2017 Plans:</b> Improve modeling of subsurface chemical concentrations of contaminants. Complete several CB-1 chapters, currently planned to include "Meteorological/Environmental Data", "Geographic Data", "Battlespace Management" and "Reconnaissance". Initiate several CB-1 chapters, currently planned to include "Test and Evaluation" and "Consequence Management".</p> <p><b>FY 2018 Plans:</b> Continue working on all 20 Chapters of CB-1. Make CB-1 available online. Continue providing access of field trial data sources to transport and dispersion community.</p>				
<p><b>Title:</b> 11) Operational Effects &amp; Planning</p> <p><b>Description:</b> Provide tools to enable the assessment and mitigation of impacts at the personnel, system, tactical, operational and strategic levels. Develop and institutionalize consensus-based, scientifically sound data and analytical methods to link CBRN exposures to relevant operational effects and to enhance test and evaluation.</p> <p><b>FY 2016 Accomplishments:</b> Continued Joint Expeditionary Collective Protection System Performance Model development and Individual Protection System Performance Model Development. Initiated health and human effects modeling capability for expanded threat list. Continued operational effects research and analysis efforts, previously referred to as Decision Support Tool, to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements setting. Completed the transition of data collected by the agent fate program into an electronic, user friendly database. Continued simulation based training development to enhance senior leader decision making during weapons of mass destruction (WMD)</p>		6.002	7.446	8.046



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>crises. Began study to investigate relationships among low level chemical nerve agent exposures, adverse individual health and physiological effects, and degradation on individual military task performance.</p> <p><b>FY 2017 Plans:</b> Continue system performance model integration and advanced development for program-wide exploitation for collective and individual protection and contamination avoidance. Continue to develop health and human effects modeling capability. Increase effort on operational effects research and analysis efforts, to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements setting.</p> <p><b>FY 2018 Plans:</b> Complete development of health and human effects modeling capability. Conduct service-specific human performance experiments aimed at better understanding operational risk. Provide objective, quantitative analysis in support of science and technology initiative, material developments, operational guidance, and requirements setting. Develop simulation-based training to enhance senior leader decision making during weapons of mass destruction (WMD) crises. Enhance CBRN operational risk assessment tools for the Navy. This includes the development of models of various ship classes and tools to assess the impact of CBRN use on individual and team tasks. Begin to study the relationships among low level chemical nerve agent exposures, adverse individual health and physiological effects, and degradation on individual military task performance.</p>				
<p><b>Title:</b> 12) Threat Agent Sciences</p> <p><b>Description:</b> Supports defensive countermeasure development against chemical and biological (CB) threats by delivering the scientific understanding and relevant estimates of the hazards posed to humans by exposure to CB agents.</p> <p>Toxicological and/or infectious-dose information and environmental response supports development and/or enhancing both operational risk and exposure guidelines; limits for detection and protection; goals for decontamination; and medical countermeasures. The knowledge generated from this program is used to inform understanding of hazards and hazard prediction models as well as to inform countermeasure development.</p> <p><b>FY 2016 Accomplishments:</b> Initiated Ebola infectious dose studies to provide data to inform operational risk and exposure guidelines, response, detection, and protection; and goals for decontamination and medical countermeasures. Continued to define particle and agent properties and predict aerosolization behavior to inform hazard assessments. Developed methods for facilitating rapid prediction of agent-substrate interactions. Delivered data on the influence of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, decontamination, and disinfection). Continued to develop Absorption, Distribution, Metabolism, Excretion, and Toxicity (ADMET) models of physiological response to agent and predictive toxicology capabilities. Characterized</p>		3.529	4.411	4.575

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> CB2 / CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
<p>priority emerging chemical and biological threats to provide critical agent data to decision makers and technology developers. Continued developing methods for biological agent characterization and environmental persistence and decontamination.</p> <p><b>FY 2017 Plans:</b> Continue to develop methods for biological agent characterization including genomic fingerprinting and tracing initiated with Ebola virus efforts. Provide environmental persistence and decontamination estimates on high priority biological threat agents, including genomic finger printing and/or tracing. Continue to define particle properties to predict aerosolization behavior to inform hazard assessment. Continue efforts to characterize the effects growth media have on the environmental fate of biological aerosols for understanding hazards. Continue developing methods to predict agent-substrate interactions.</p> <p><b>FY 2018 Plans:</b> Continue developing advanced methods for biological agent characterization. Continue to deliver environmental metagenomic information. Continue providing data on fate, persistence, and response of priority biological agents in various environments to reveal latent details on their behavior. Continue developing methods to understand biological agent fate on surfaces and begin developing methods for understanding energetic materials for vulnerability assessments and signature identification and development. Continue defining particle properties and agent-substrate interaction to predict agent behavior and aerosolization to inform hazard assessment. Continue with relevant biological toxicity and infectious dose studies to provide data to inform operational risk and exposure guidelines, response, detection, and protection; and goals for decontamination and medical countermeasures. Continue assessing the impact of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, decontamination, and disinfection).</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	50.049	56.191	71.654

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB3: CHEMICAL BIOLOGICAL DEFENSE (ATD)	17.141	19.109	18.093	-	18.093	21.835	21.790	21.837	21.835	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
N/A

**E. Performance Metrics**  
N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
NT2: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)	-	65.810	64.476	56.187	-	56.187	54.223	54.721	52.894	52.883	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project NT2 provides early applied research to enhance and develop defensive capabilities against Non-Traditional Agents (NTAs). This project focuses on expanding scientific knowledge required to develop defensive capabilities and to demonstrate fast and agile scientific responses to enhance or develop capabilities that address emerging threats. Efforts in this project support an integrated approach to counter emerging threats through innovative science and technology (S&T) solutions for detection, protection, decontamination, information systems and modeling and simulation, and medical countermeasures. This project is a comprehensive and focused effort for developing NTA defense capabilities, coordinated with specific interagency partners for doctrine, equipment, and training for the Warfighter and civilian population for defense against NTAs.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) Material Contamination Mitigation</p> <p><b>Description:</b> Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort.</p> <p><b>FY 2016 Accomplishments:</b> Completed Point-of-Use Formulation (previously named Dial a Decon) effort and transitioned data, including NTA efficacy data to the JPM-P Joint General Purpose Decontaminant - Hardened Military Equipment program of record. Continued the effort using zirconium hydroxide (Zr(OH)4) to meet warfighter immediate and operational NTA decontamination needs. Integrated NTAs, including newly identified emerging threats, into all material contamination mitigation projects.</p> <p><b>FY 2017 Plans:</b> Continue integrating NTAs, including newly identified emerging threats into the continuing Government owned decontaminant formulation, sensitive equipment decontamination (enzyme and catalytic) projects, responsive coatings, multiple system integration, and the full hazard mitigation technology development portfolio. Initiate focus on hazard mitigation of other emerging threats and classes of NTAs, including data sharing with international partners. Incorporate data gathered from surface science effort to inform design of new approach on Government owned formulation.</p> <p><b>FY 2018 Plans:</b></p>	1.309	3.142	1.939

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue integrating the full range of NTAs into the material contamination mitigation portfolio. Continue responsive coatings efforts to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals. Continue effort to examine how decontamination technologies perform on field assets when contaminated with other than CASARM (laboratory quality/pure) NTAs. Continue efforts to develop/enhance NTA mapping (disclosure/assurance) technologies.			
<p><b>Title:</b> 2) Personnel Contamination Mitigation</p> <p><b>Description:</b> Develop new technologies to mitigate the risk associated with contaminated human remains and personal effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents.</p> <p><b>FY 2016 Accomplishments:</b> Transitioned human remains storage data to the human remains related programs and the Joint Mortuary Affairs Center (JMAC), Fort Lee, Virginia. Integrated NTA threats into Personnel Decontamination hazard mitigation projects to develop an alternative to Reactive Skin Decontamination Lotion (RSDL).</p> <p><b>FY 2017 Plans:</b> Continue mass casualty personnel decontamination projects to develop technology to manage the specific issues (throughput and efficacy) associated with mass casualty decontamination that include efficacy against NTAs and emerging threats decontamination to support warfighter operations, including homeland defense mission.</p> <p><b>FY 2018 Plans:</b> Transition technology data developed by efforts to develop an alternative to RSDL, including efficacy data against representative NTAs to Next Generation Personnel Decontamination. Initiate personnel decontamination efforts to enhance current processes and support mass casualty personnel decontamination warfighter operations, including homeland defense mission, including efficacy data against representative NTAs.</p>	0.519	1.669	1.761
<p><b>Title:</b> 3) Respiratory and Ocular Protection</p> <p><b>Description:</b> Development and analysis of design alternatives for chemical and biological air-purifying respirators that provide enhanced protection with lower physiological burden and improved interface with mission equipment.</p> <p><b>FY 2017 Plans:</b> Continue to investigate performance limitations current and developmental of respiratory protection technologies against NTA challenges and investigate counter-measures to these specific limitations.</p> <p><b>FY 2018 Plans:</b></p>	-	0.358	0.733

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue to develop and demonstrate upgrades to existing air purification (including respiratory protection) technologies to enable broad spectrum protection and extended filter life. Assess novel filtration materials against new NTAs and compounds of interest.			
<p><b>Title:</b> 4) Chemical Diagnostics - Medical</p> <p><b>Description:</b> Focuses on developing state-of-the-art laboratory/fieldable methods to detect exposure to non-traditional agents in clinical samples. Identifies biomolecular targets that can be leveraged as analytical methodologies, as well as, laboratory and animal studies characterizing time-course and longevity of a particular analyte/biomarker. Supports the analytics for traditional agent diagnostics and hand-held diagnostic technologies that might be applied to NTA diagnostics.</p> <p><b>FY 2016 Accomplishments:</b> Continued to expand NTA biomarkers for additional compounds. Optimized method development for identification and validation of NTAs in clinical samples for additional compounds of interest. All efforts transition to TM2 (Techbase Med Defense)/Chemical Diagnostics in FY17.</p>	2.248	-	-
<p><b>Title:</b> 5) Chemical Pretreatments - Medical</p> <p><b>Description:</b> Develops pretreatments and prophylactics that provide protection against NTAs and emerging chemical threats. Prophylactic medical countermeasures (MCMs) include catalytic and stoichiometric bioscavengers that rapidly bind and detoxify a broad spectrum of NTAs.</p> <p><b>FY 2016 Accomplishments:</b> Continued focused studies to identify lead catalytic bioscavenger candidates against NTA exposure in validated animal models. Continued development of a catalytic bioscavenger cocktail effective against multiple NTAs. Continued to explore alternative technologies for bioscavenging enzymes to address capability gaps such as immunogenicity, circulatory stability, dosing, shelf-life, and delivery. Continued efforts to develop nanotechnology enabled prophylaxis. Continued research projects at the Absorption, Distribution, Metabolism, Excretion and Toxicology (ADMET) Center of Excellence (CoE) to improve MCM understanding and facilitate development.</p> <p><b>FY 2017 Plans:</b> Explore bioscavengers administered as post-exposure, pre-symptomatic prophylaxis against NTAs in validated animal models. Evaluate Food and Drug Administration (FDA) licensed MCMs for potential pretreatment/prophylaxis against NTAs and emerging chemical threats.</p> <p><b>FY 2018 Plans:</b> Continue efforts to identify and develop catalytic enzymes for use against selected, priority NTAs. Continue to explore alternative technologies for bioscavenging enzymes to address capability gaps such as immunogenicity, circulatory stability, dosing, shelf-</p>	11.605	9.838	8.837

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
life, and delivery. Initiate development of new platform technologies such as modulation of endogenous protein expression or other innate protective response. Complete investigation of nanotechnology to support prophylactic countermeasures. Continue research projects at the ADMET CoE to improve MCM understanding and facilitate development.			
<p><b>Title:</b> 6) Chemical Therapeutics - Medical</p> <p><b>Description:</b> Investigates common mechanisms of agent injury. Determines the toxic effects of agents by probable routes of field exposure, as well as standard experimental routes. Physiological parameters and pathological assessments will be used to establish the general mode and mechanism(s) of toxicity. Develops, assesses, evaluates, and validates therapeutics for treatment resulting from exposure to NTAs and emerging chemical threats.</p> <p><b>FY 2016 Accomplishments:</b> Synthesized analogs of known and novel therapeutic compounds that cross the blood brain barrier. Evaluated compounds in high-throughput, in vitro screens for reactivation of cholinesterases. Investigated known, licensed, FDA-approved countermeasures for use against selected, priority NTAs. Continued research projects at the ADMET CoE to improve MCM understanding and facilitate development.</p> <p><b>FY 2017 Plans:</b> Continue to optimize novel therapeutic compounds that cross the blood brain barrier and can be used as treatments for NTA exposures. Continue to evaluate licensed FDA therapeutics against NTAs for potential EUA. Continue to utilize the ADMET CoE to support evaluation and development of new NTA therapeutics.</p> <p><b>FY 2018 Plans:</b> Continue pursuit of analogs of therapeutic compounds to treat NTA exposures. Continue to test compounds using high-throughput, in vitro screens. Continue to evaluate licensed FDA therapeutics against selected, priority NTAs. Continue to evaluate compounds at the ADMET CoE to identify leads. Continue to evaluate FDA licensed/approved products for therapeutic applications for countering the deleterious effects of chemical agent exposure. Initiate additional animal studies to support regulatory submission of candidate therapeutics for treatment of the toxic effects of selected, priority NTAs.</p>	15.065	17.492	20.670
<p><b>Title:</b> 7) Detection</p> <p><b>Description:</b> Primary focus is to assess the potential of multiple technologies to meet the needs to detect the presence of NTAs.</p> <p><b>FY 2016 Accomplishments:</b> Completed development from technology concepts and models to meet the needs to detect contamination on surfaces in pre and post decontamination application. Continued concept and technology development for chemical threat early warning detection. Initiated the development an on-man sensor for detecting exposure to chemical hazards. Initiated the development of a low-cost</p>	12.376	10.333	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
chemical detection capability utilized for identification of liquid threats, and transitioned to NT3 (Techbase Non-Traditional Agents Defense)/Detection.  <b>FY 2017 Plans:</b> Continue development from technology concepts and models to meet the needs to detect contamination on surfaces in pre and post decontamination applications. Continue concept and technology development for chemical threat early warning detection.			
<b>Title:</b> 8) Modeling & Simulation  <b>Description:</b> Provide modeling of NTA materials for hazard prediction. Develop NTA source term algorithms for predicting chemical hazards from intentionally functioning weapons, counter-proliferation scenarios (bomb on target), and missile intercept. Investigate NTA agent fate for secondary effects, environmental/atmospheric chemistry, atmospheric and waterborne transport and dispersion, human effects, model Validation and Verification (V&V), scaled testing, casualty estimation, and supporting data management.  <b>FY 2016 Accomplishments:</b> Completed analysis of data resulting from small-scale testing of NTA simulants and continue test execution. Continued sensitivity and validation studies on NTA source term models and update and expand NTA databases. Continued initial development of agent fate modeling for NTAs.  <b>FY 2017 Plans:</b> Continue sensitivity and validation studies on NTA source term models and update and expand NTA databases. Continue development of agent fate modeling for NTAs.  <b>FY 2018 Plans:</b> Initiate additional small-scale testing of NTA simulants and provide test data for source term model development.	1.582	1.738	1.722
<b>Title:</b> 9) Threat Agent Sciences  <b>Description:</b> Provide critical agent characterization (physical and physiological/toxicological) data on current and emerging threat agents to prepare for surprise which enables and informs development and testing of NTA defense technology such as detection, decontamination, protection, and hazard assessment. This preliminary assessment of new threats informs decision makers, Concept of Operations (CONOPs) and Tactics, Techniques and Procedures (TTP) Development as well as provides the basis for all countermeasure development and assessment.  <b>FY 2016 Accomplishments:</b>	21.106	19.906	20.525

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Provided supportable data to enable countermeasure development and testing as well as inform CONOPs, policies, doctrines and procedures. Continued to characterize the synthesis physico-chemical properties and environmental fate of priority NTAs. Continued preparing laboratory and operational toxicity estimates for next priority NTAs. Refined and delivered human toxicity estimates for next priority NTAs. Continued to develop in-silico platforms for predicting human ADMET of threat agents. Characterized priority emerging threats, including those areas where the threats converge, to provide critical agent parameters to decision makers for hazard assessment and response, and for countermeasure development. Initiated roadmapping and gap identification to build a predictive Threat Agent Science or Computational Rapid Identification &amp; Scientific Threat Analysis (CRISTAL) capability for DoD. Initiated predictive toxicology research efforts to support development of the CRISTAL capability.</p> <p><b>FY 2017 Plans:</b> Continue to characterize priority emerging threats to provide critical agent parameters to decision makers and technology developers to support countermeasure development and testing, informs concept CONOPs, policies, doctrines and procedures. Build linkages between emerging threat characterization and advanced development capability assessments to better define current capability gaps. Continue the evaluation of synthesis pathways, physico-chemical properties and environmental fate properties for priority threats. Continue assessing the impact of environmental factors and substrate properties on threat agent activity (persistence, transport, degradation, resuspension, etc). Continue preparing laboratory and operational toxicity estimates for next priority NTAs. Refine and deliver human toxicity estimates for next priority NTAs. Continue to develop in-silico platforms for predicting human ADMET of threat agents.</p> <p><b>FY 2018 Plans:</b> Continue characterizing priority emerging threats to provide critical supportable data to enable countermeasure development and testing as well as inform CONOPs, policies, doctrines and procedures. Continue to build linkages between emerging threat characterization and advanced development capability assessments to better define current capability gaps for emerging threats. Continue evaluating synthesis pathways, physicochemical properties and environmental fate properties for priority threats. Continue assessing the impact of environmental factors and substrate properties on threat agent activity (persistence, transport, degradation, resuspension, etc.). Continue preparing laboratory and operational toxicity estimates for next priority NTAs. Continue to refine and deliver human toxicity estimates for next priority NTAs. Initiate development of medium- to high-throughput laboratory approaches to predict acute systemic toxicity in support of CRISTAL capability. Expand computational and in vitro research efforts concerning ADMET, physical characterization and behavior to support development of the CRISTAL capability. Initiate efforts to integrate the computational and in vitro predictive tools developed for CRISTAL to provide a computational user interface that can accommodate multiple streams of data and provide outputs based on best available information.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	65.810	64.476	56.187



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> NT2 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• NT3: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)	20.633	17.173	23.655	-	23.655	22.893	24.347	30.490	31.291	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2					<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)				<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TM2: TECHBASE MED DEFENSE (APPLIED RESEARCH)	-	86.253	68.048	73.212	-	73.212	72.974	73.347	76.360	76.348	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project TM2 provides for applied research for innovative technology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat disease due to exposure to chemical and biological threat agents. Categories for this project include core science efforts in Medical Chemical, Medical Biological, Diagnostics, and the Medical Countermeasures Initiative (MCMI). This project supports applied research for the investigation of new medical countermeasures to include prophylaxes, pretreatments, antidotes, skin decontaminants, and therapeutic drugs against identified and emerging biological and chemical warfare agents. Medical Science and Technology (S&T) efforts in this Budget Activity refine promising medical initiatives identified in Budget Activity 1, resulting in the development of countermeasures to protect against and treat the effects of exposure to chemical and biological (CB) agents. Diagnostic research focuses on providing high quality data closer to the point-of-need comprising device innovation, panels of biomarkers driven by bioinformatics, and epidemiological modeling tools.

MCMI was established to coordinate inter-related advanced development and flexible manufacturing capabilities, and these efforts within science and technology (S&T) have been concentrated in advancing two areas: 1) regulatory science and 2) flexible manufacturing technologies and processes for MCMs. These MCMI efforts are enablers supporting the DoD Medical Countermeasures Advanced Development and Manufacturing (MCM-ADM) capability. The focus of these efforts is unchanged, but starting in FY17 all MCMI efforts under TM2 are transitioned into Viral/Bacterial/Toxins Vaccines, Vaccine Platforms and Research Tools, and Bacterial Therapeutics to reduce budget management complexity and highlight the range of MCM efforts ongoing with the ADM.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) Biosurveillance	3.920	4.182	4.171
<b>Description:</b> Biosurveillance/Disease Surveillance: Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools. The Chemical Biological Defense Program partners with civil agencies and DoD agencies to provide near real-time information and provide situational awareness, yielding analytical and predictive capabilities for DoD decision makers including Combatant Commanders.			
<b>FY 2016 Accomplishments:</b> Continued the development of the Biosurveillance Ecosystem to include analyst collaboration tools, advanced analytics, and analyst workbench. Continued various biosurveillance analytic capabilities. These capabilities include the following: real-time			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>disease forecasting; agricultural animal population database for zoonotic disease analysis; an online crowdsourcing game for bacterial genome assembly to enhance rapid pathogen discovery and identification; biosurveillance analysis using clinical diagnoses and social media indicators in military populations; capability to assess the risk of disease spread to the United States; a data-driven framework for zoonotic disease prediction; biosurveillance visualization capabilities; and a Global Rapid Identification Tool for diagnosing infectious disease bioevents.</p> <p><b>FY 2017 Plans:</b> Development of Biosurveillance Ecosystem is shifted to Biosurveillance. Complete the next iteration of analytic capabilities, specifically an agricultural animal population database for zoonotic disease analysis, an online crowdsourcing game for bacterial genome assembly to enhance rapid pathogen discovery and identification, a capability to assess the risk of disease spread to the United States, a data-driven framework for zoonotic disease prediction, and tools for diagnosing infectious disease bioevents. Continue development of biosurveillance analytic capabilities, including real-time disease forecasting capabilities, novel visualization capabilities, mobile applications, an ecological analytics capability to monitor and map global, near-real-time areas at risk of emerging infectious diseases, an ability to link sequencing at remote locations with the Biosurveillance Ecosystem. Develop next generation of technologies with focus on synthesizing large volumes of data to enable analysts and decision makers to make informed decisions in real-time. Initiate new efforts to explore utilizing ensemble approaches to disease forecasting.</p> <p><b>FY 2018 Plans:</b> Continue development of biosurveillance analytic capabilities, including real-time disease forecasting capabilities, novel visualization capabilities, mobile applications, an ecological analytics capability to monitor and map global, near-real-time areas at risk of emerging infectious diseases. Continue new efforts to explore utilizing ensemble approaches to disease forecasting. Initiate Integrated Early Warning Ecosystem to provide improved CBD situational awareness, a common analytical work bench for users, integration and fusion of a wide array of relevant data sources, and decision support tools for the tactical to strategic level command authorities. The intent is to leverage advances gained in the Biosurveillance Ecosystem development for application in the wider Integrated Early Warning domain. This effort will be funded out of both CB2 (Chemical Biological Defense)/Biosurveillance and TM2 (Techbase Med Defense)/Biosurveillance. Efforts in this budget will focus on medical and diagnostic data and analytics.</p>				
<p><b>Title:</b> 2) Chemical Diagnostics</p> <p><b>Description:</b> Focuses on developing state-of-the-art laboratory/fieldable methods that detect exposure to chemical warfare and/or non-traditional agents (CWA/NTA) in clinical samples. Identifies biomolecular targets that can be leveraged as analytical methodologies, as well as, laboratory and animal studies characterizing time-course and longevity of a particular analyte/ biomarker.</p> <p><b>FY 2016 Accomplishments:</b></p>		0.882	0.149	3.482

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued development of assays for enhancing the ability to identify sublethal exposure to emerging chemical agent threats using newly-identified biomolecular targets for third series of compounds. Continued developing confirmatory assays for discovered markers. Initiated and completed small-scale telemetric study using animals.  <b>FY 2017 Plans:</b> Complete development of assays for enhancing the ability to identify sublethal exposure to emerging chemical agent threats using newly-identified biomolecular targets for third series of compounds. Complete the development of confirmatory assays for discovered markers and continue assay verification studies.  <b>FY 2018 Plans:</b> Complete development of assays for enhancing the ability to identify sublethal exposure to emerging chemical agent threats using newly-identified biomolecular targets for third series of compounds for organophosphate (OP) nerve agents generating butyrylcholinesterase (BChE). Complete the development of confirmatory assays for discovered markers. Initiate assay verification studies and investigations to mature chemical diagnostic assays for use in forward field settings or at point-of-need.				
<b>Title:</b> 3) Diagnostic Assays  <b>Description:</b> Focuses on in-vitro assay development for viral vaccines.  <b>FY 2016 Accomplishments:</b> Developed in-vitro assays for Western, Eastern, and Venezuelan Equine Encephalitis (WEVEE) virus vaccines. Developed in-vitro assays for VEE virus protease activity and structure based discovery of viral protease inhibitors. All efforts transition to TM2 (Techbase Med Defense)/Viral/Bacterial/Toxins Vaccines in FY17.		0.119	-	-
<b>Title:</b> 4) Diagnostic Assays  <b>Description:</b> Development and verification of rapid, sensitive, and specific tests for the identification of Biological Warfare Agents (BWA) and their expressed pathogens and toxins in clinical specimens from Warfighters for the diagnosis of exposure/infection. Discovery of host biomarkers generated in response to exposure to biological threat agents, whether known or emerging.  <b>FY 2016 Accomplishments:</b> Continued to optimize processes and platform technologies employed in laboratory characterization of host and pathogen biomarker signatures of exposure and disease processes. Continued discovery and identification of host response and/or agent biomarkers. Continued to develop nanomaterial structure designs to enable companion diagnostics. Initiated efforts and feasibility studies on integrating identification of antimicrobial resistance into future diagnostic systems. Initiated designs and studies on the development of vertical flow immunoassays.  <b>FY 2017 Plans:</b>		9.182	4.268	3.551

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Continue to optimize processes and platform technologies employed in laboratory characterization of host and pathogen biomarker signatures of exposure and disease. Continue discovery and identification of host response biomarkers. Continue efforts and initiate verification studies for RADAR and feasibility of integrating identification of antimicrobial resistance into future diagnostic systems. Initiate the investigation for designing biomarker validation methods and activities.</p> <p><b>FY 2018 Plans:</b> Continue to optimize processes and platform technologies employed in laboratory characterization of host and pathogen biomarker signatures of exposure and disease. Continue discovery and identification of host response and/or agent biomarkers. Complete efforts and initiate verification studies on integrating identification of antimicrobial resistance into future diagnostic systems. Initiate the investigation for designing biomarker validation methods and activities. Complete designs and studies on the development of vertical flow immunoassays. Initiate assay development for extremely difficult to detect/diagnosis intracellular pathogens of severe acute systemic febrile illnesses.</p>				
<p><b>Title:</b> 5) Next Generation Diagnostics</p> <p><b>Description:</b> Diagnostic device development to include systems able to harness next generation technologies to revolutionize clinical diagnostics in care facilities and in hospital laboratories. This investment will incorporate capabilities such as next generation sequencing and advanced biomolecular methods to harness both host and pathogen biomarkers in a threat agnostic approach that will serve all echelons of military medical care.</p> <p><b>FY 2016 Accomplishments:</b> Continued development of multiplexed point of need diagnostic platform technologies into syndromic-based panels. Continued transition of candidate diagnostic technologies to NGDS Increment 2 in TM3 (Techbase Med Defense)/Diagnostic Device Platforms in FY17. Initiated high sensitivity immunoassay and protein detection platforms for clinical samples.</p> <p><b>FY 2017 Plans:</b> Complete development of multiplexed point of need diagnostic platform technologies into syndromic-based panels. Initiate development of sample preparation techniques to enhance clinical diagnostic platforms.</p> <p><b>FY 2018 Plans:</b> Continue development of sample preparation techniques to enhance clinical diagnostic platforms.</p>		9.721	3.685	1.392
<p><b>Title:</b> 6) Medical Countermeasures Initiative</p> <p><b>Description:</b> Integrate the regulatory science and manufacturing technologies and processes developed into the DoD MCM-ADM as enablers of the advanced development and flexible manufacturing.</p> <p><b>FY 2016 Accomplishments:</b></p>		10.109	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Evaluated novel conjugation approaches for polysaccharide based vaccines. Continued technology transfer of process development and manufacturing activities with Advanced Development Manufacturing (ADM) facility. All efforts transitioned to TM2 (Techbase Med Defense)/Viral/Bacterial/Toxins Vaccines, Vaccine Platforms and Research Tools, and Bacterial Therapeutics in FY17.</p> <p><b>Title:</b> 7) Viral/Bacterial/Toxins Vaccines</p> <p><b>Description:</b> Generate novel or improved vaccines against viral, bacterial and toxin biothreat agents, and demonstrate preliminary efficacy in small animal models. Develop assays that identify correlates of protective immunity in animal models.</p> <p><b>FY 2016 Accomplishments:</b> Refined animal model development projects with regulatory guidance, including animal models for aerosolized Burkholderia mallei and B. pseudomallei (melioidosis). Evaluated candidate Burkholderia vaccines in small and large animal models. Assessed correlates of immunity elicited by Burkholderia and Coxiella (Q-fever) species. Tested promising vaccine candidates designed to protect against genetically engineered Anthrax strains for safety and efficacy in NHPs. Continued testing of vaccine candidates for protection against aerosolized Type A Francisella tularensis infection and initiate alternative candidate vaccine. Expanded to two approaches for Q Fever vaccines. Developed and evaluated bridging strategies for interim fielding capability readiness.</p> <p><b>FY 2017 Plans:</b> Execute down-selection of FDA Animal Rule compliant non-human primate model for aerosolized Burkholderia pseudomallei (melioidosis), which adequately mimics progression of human disease. Continue correlates of immunity studies: Characterize specific antibody responses during human Burkholderia pseudomallei (melioidosis) and Coxiella (Q-fever) infections. Complete data analysis for studies involving novel subunit, polysaccharide, and OMV-based candidate Burkholderia (glanders and melioidosis) vaccines in small and large animal models. Continue to evaluate and define in composition type A Francisella tularensis (Tularemia) vaccine prototypes in established small animal and NHP models for safety and efficacy. Develop a non-reactogenic Coxiella (Q-fever) vaccine and a humanized mouse model for aerosolized Q-fever [moved from TM2/MCMI]. Evaluate prototypic three-component vaccines against WEVEE viruses in small animal models with down-selected adjuvants. Initiate immune correlate studies with a three-component vaccine against WEVEE viruses in small animal models. Evaluate immunogenicity and efficacy of nanoparticle adjuvants with the VEEV DNA vaccine and the trivalent (WEVEE) vaccine in mice. Continue to assess the ability of novel adjuvants to enhance the protective efficacy of viral vaccines. Initiate research to assess MCM capabilities and strategies to defend against emerging and genetically engineered bioweapon (BW) threat agents.</p> <p><b>FY 2018 Plans:</b> Complete qualification/validation of well-defined animal models of Burkholderia and Q Fever. Continue analysis of T and B cell antigen-based Q Fever vaccine candidates. Initiate manufacturing and investigative new drug (IND) enabling studies of OMV or other lead Burkholderia candidates based on results in animal models refined toward Animal Rule Licensure use. Down select</p>		10.479	15.026	17.629

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>tularemia vaccine based on efficacy in animals for advancement to clinical studies. Evaluate efficacy of multivalent monoclonal antibody cocktail for protection against multiple serotypes of botulinum neurotoxin in relevant animal models. Evaluate potential animal models for medical countermeasure development against broad spectrum of biological toxins. Continue nonclinical efficacy and clinical safety development of multivalent filovirus vaccine against Zaire ebolavirus, Sudan ebolavirus and Marburgvirus. Continue comparison of homologous and heterologous prime-boost regimens with filovirus candidates. Continue detailed dissection of the immune response following alphavirus and filovirus vaccination by epitope mapping and B-cell antigen receptor (BCR) antibody repertoire analysis. Continue evaluation of immunogenicity and efficacy of nanoparticle adjuvanted VEEV DNA vaccine and the trivalent WEVEE vaccine in NHP. Initiate development of multiplexed VEEV infection biomarker assay. Continue to assess MCM capabilities and strategies to defend against emerging and genetically engineered bioweapon (BW) threat agents.</p> <p><b>Title:</b> 8) Vaccine Platforms and Research Tools</p> <p><b>Description:</b> Use novel technology and methods to support development of vaccine candidates. Conduct studies to determine potential immune interference between lead vaccine candidates, the effect of alternative vaccine delivery methods, and thermo-stabilization technologies on the efficacy of lead vaccine candidates. Identify correlates of protection in humans, and predict the success of lead vaccine candidates in humans.</p> <p><b>FY 2016 Accomplishments:</b> Maintained studies that utilize clinical samples from Filovirus outbreaks in multiple international locations to refine definition of clinically relevant correlates of immunity. Initiated novel adjuvants as platforms for utilization in biodefense vaccines. Developed and evaluated bridging strategies for interim fielding capability readiness.</p> <p><b>FY 2017 Plans:</b> Complete evaluation of hybrid antigenic proteins for use in broad spectrum vaccines for Staphylococcus Enterotoxins in relevant small animal models [moved from TM2/MCMI]. Downselect to most promising Toll-Like Receptors against adjuvants for testing in vivo with relevant vaccines [moved from TM2/MCMI]. Exploration of novel formulation and targeting systems for enhanced vaccine potency.</p> <p><b>FY 2018 Plans:</b> Initiate construction and evaluation of hybrid alphavirus E1/E2 antigenic vaccines. Maintain capability and assess biodefense Burkholderia vaccine candidates in the in vitro biomimetic Modular IMMune In-vitro Construct (MIMIC) system. Evaluate production and scale-up of trivalent inactivated alphavirus vaccines and use these particles to generate new WEVEE monoclonal antibodies (mAbs). Analyze mAbs for neutralizing activity and map epitopes of strongly neutralizing mAbs. Establish, organize, and sustain the Human Specimen Archive at USAMRIID. Continue in vivo down selection of next generation TLR agonist adjuvants. Initiate evaluation of hybrid antigenic proteins for use in broad spectrum vaccines for alphaviruses.</p>		8.419	6.928	8.191
<b>Title:</b> 9) Viral Therapeutics		6.867	9.284	10.983

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Identify, optimize and evaluate lead candidate therapeutics for efficacy against viral pathogens.</p> <p><b>FY 2016 Accomplishments:</b> Evaluated FDA-approved drugs for potential repurposing as effective antivirals. Continued to evaluate novel antibody-based therapeutics for Filovirus infections. Continued identification and evaluation of novel pathogen-directed therapeutics for Filoviruses and Alphaviruses.</p> <p><b>FY 2017 Plans:</b> Screen and evaluate novel small molecule inhibitors of alphaviral infections in vitro and in vivo. Evaluate novel formulations to deliver antivirals to target sites and/or to enable new dosing methods. Evaluate modified nucleoside analogues as inhibitors of alphaviral infections in animal models for their access to the central nervous system and ability to inhibit encephalitic complications. Identify novel nuclear import and export inhibitors for modulation of capsid localization against alphaviruses. Initial studies target Venezuelan equine encephalitis (VEE), but there is potential for broad spectrum activity against WEE and EEE, as well.</p> <p><b>FY 2018 Plans:</b> Continue screening, evaluation and development of novel small molecule inhibitors and monoclonal antibodies effective against filo- and alpha-virus infections in vitro and in vivo. Continue development of small molecule ribonucleoside inhibitors directed against alphaviruses. Develop alphavirus animal models for evaluation of therapeutic countermeasures. Continue optimization of broad-spectrum inhibitors of filovirus infection that antagonize the NPC1-GP interaction. Continue studies to enhance Anti-viral Therapy Against Ebola (Zaire) and Marburg Viruses. Development of an inhalation model of VEEV in the common marmoset. Continue funding small molecule/repurposing efforts.</p>				
<p><b>Title:</b> 10) Bacterial Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate lead therapeutic candidates effective against designated bacterial threat agents.</p> <p><b>FY 2016 Accomplishments:</b> Augmented FDA approved and late stage development drug screening programs for BWAs and determined in vitro susceptibilities. Evaluated reformulation and/or targeted delivery approaches to enhance efficacy of poorly performing or failed drug candidates. Evaluated efficacy of bioactive peptides for the ability to stimulate host protective pathways in mouse models. Identified and validated novel targets and initiate small molecule screening for inhibitors. Developed alternative animal models to evaluate efficacy of candidates against otherwise nonpathogenic Multi-Drug Resistant (MDR) BW surrogate strains.</p> <p><b>FY 2017 Plans:</b></p>		9.243	8.484	9.775



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Evaluate FDA approved or late stage therapeutics for activity against Burkholderia, Francisella tularensis, Bacillus anthracis, and Yersinia pestis. Continue to evaluate reformulation and/or targeted delivery approaches to enhance efficacy of poorly performing or failed drug candidates. Continue the discovery and advancement of non-traditional strategies to diversify approaches to identify lead therapeutic candidates against bacterial infection. Continue generation of MDR surrogate panels to bridge the gap between antimicrobial resistant biowarfare agents and multi-drug resistant clinical pathogens. Organotypic platform-related work previously funded under TM2/MCMI will be continued here.</p> <p><b>FY 2018 Plans:</b> Continue the discovery and advancement of non-traditional, as well as traditional, strategies to diversify approaches to identify lead therapeutic candidates against bacterial infection. Continue evaluation of FDA approved and mid to late stage therapeutics for activity against wildtype and MDR Francisella tularensis, Bacillus anthracis, Yersinia pestis, and Burkholderia species. Continue to evaluate reformulation and/or targeted delivery approaches to enhance efficacy of poorly performing or failed drug candidates.</p>				
<p><b>Title:</b> 11) Toxin Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate therapeutic candidates that are effective against biological toxin agents.</p> <p><b>FY 2016 Accomplishments:</b> Continued to synthesize and optimize novel BoNT small organic molecules inhibitors (SMI) in in vitro assays (enzymology and ADME) and in vivo PK tolerability in rodents and rabbits. Continued to assess regenerative medicine opportunities vis-a-vis insulin-like growth factor IGF-1 muscle regeneration in rats extensor digitorum longus (EDL) model. Initiated evaluation of late development and FDA approved drugs for treatment of staphylococcal enterotoxin B intoxication.</p> <p><b>FY 2017 Plans:</b> Further evaluate most potent small molecule BoNT/A inhibitors in neuronal assays and ex vivo model systems.</p> <p><b>FY 2018 Plans:</b> Perform safety (Good Laboratory Practice-GLP) studies with one SMI; select candidates for IND submission of one SMI and IGF-1 for treatment post BoNT A intoxication.</p>		3.544	2.015	1.000
<p><b>Title:</b> 12) Pretreatments, Nerve Agents</p> <p><b>Description:</b> Develop pretreatments and prophylactics that provide protection against all organophosphorus (OP) nerve agents. Pretreatments/prophylactics include both stoichiometric and catalytic bioscavengers that rapidly bind and detoxify a broad spectrum of OP nerve agents.</p> <p><b>FY 2016 Accomplishments:</b></p>		2.032	1.669	0.593

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Selected promising G-type nerve agent catalytic bioscavengers candidates to analyze. Continued developing V-type nerve agent catalytic bioscavenger, and a regimen of catalytic bioscavengers effective against multiple nerve agents.</p> <p><b>FY 2017 Plans:</b> Continue to optimize catalytic bioscavengers for acceptable in vivo toxicity profile, pharmacokinetic (PK) and efficacy activity against G-type and V-type OP nerve agents in appropriate animal models.</p> <p><b>FY 2018 Plans:</b> Continue efforts developing prophylactic medical countermeasures including bioscavengers. Continue efforts developing prophylactic and pretreatment medical countermeasures, including bioscavengers. Initiate development of animal models for operationally relevant exposures to better support development of pretreatment and prophylactic MCMs and MCM concepts of use including post-exposure pre-symptomatic applications.</p>				
<p><b>Title:</b> 13) Chemical Therapeutics</p> <p><b>Description:</b> Focuses on therapeutic strategies to effectively minimize injuries resulting from exposure to chemical warfare agents (CWAs). This effort involves the development of neuroprotectants, anticonvulsants, and improved therapies for enzyme reactivation. This work is designed to develop potential candidates that will ultimately be submitted for FDA licensure or to identify previously licensed products for new uses in the treatment of chemical warfare casualties.</p> <p><b>FY 2016 Accomplishments:</b> Focused on refined technology that facilitates delivery of therapeutic regimen to the central nervous system (crossing the blood brain barrier (BBB)). Selected promising molecular, nanomaterial-based drug delivery platforms for further development. Developed and screened for new potential leads as broad spectrum/centrally acting cholinesterase reactivators. Developed a quick computational method to approximate binding of reactivators in OP- adducted cholinesterase binding site. Devised a predictive computational approach to simulate compound penetration of the BBB and applied to library of test compounds.</p> <p><b>FY 2017 Plans:</b> Support in vivo validation and characterization of therapeutics for: 1) an improved broad spectrum oxime; 2) compounds effective in the brain for enhanced neuroprotection and 3) compounds effective in the brain for enhanced survival. Continue exploring technologies for delivery of therapeutics to the brain (crossing the blood brain barrier). Continue supporting development and screening for broad spectrum cholinesterase reactivators that work in the brain. Continue development of animal models for realistic operational threat agent exposure and MCM development. Investigate dermal treatments and therapeutics for nerve agent and sulfur mustard exposure.</p> <p><b>FY 2018 Plans:</b></p>		11.736	12.358	12.445

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602384BP / CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	<b>Project (Number/Name)</b> TM2 / TECHBASE MED DEFENSE (APPLIED RESEARCH)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
Continue synthesizing and screening broad spectrum reactivators. Continue testing of BBB penetration. Continue developing computational capabilities using molecular dynamics to predict compound ability to penetrate the BBB. Continue exploring alternate modes of drug encapsulation for delivery across the BBB. Continue development of animal models for operationally relevant threat agent exposure and medical countermeasure efficacy.			
<b>Accomplishments/Planned Programs Subtotals</b>	86.253	68.048	73.212

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TM3: TECHBASE MED DEFENSE (ATD)	89.090	83.838	92.846	-	92.846	88.809	93.823	104.821	104.255	Continuing	Continuing
• MB4: MEDICAL BIOLOGICAL DEFENSE (ACD&P)	68.160	65.648	83.999	-	83.999	73.090	35.432	26.460	13.317	Continuing	Continuing
• MC4: MEDICAL CHEMICAL DEFENSE (ACD&P)	1.060	5.681	5.165	-	5.165	2.790	4.675	3.975	7.098	Continuing	Continuing
• MB5: MEDICAL BIOLOGICAL DEFENSE (EMD)	80.412	106.223	136.553	-	136.553	107.315	141.385	170.160	146.138	Continuing	Continuing
• MC5: MEDICAL CHEMICAL DEFENSE (EMD)	64.773	39.504	47.388	-	47.388	62.092	38.576	40.607	31.746	Continuing	Continuing
• MB7: MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)	8.541	7.145	11.950	-	11.950	9.850	3.728	6.060	6.532	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
N/A

**E. Performance Metrics**  
N/A

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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	134.070	127.941	145.359	-	145.359	141.728	146.813	157.081	160.162	Continuing	Continuing
CB3: <i>CHEMICAL BIOLOGICAL DEFENSE (ATD)</i>	-	17.141	19.109	18.093	-	18.093	17.585	17.540	17.587	17.585	Continuing	Continuing
NT3: <i>TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)</i>	-	20.633	17.173	23.655	-	23.655	22.893	23.047	28.190	31.291	Continuing	Continuing
TM3: <i>TECHBASE MED DEFENSE (ATD)</i>	-	89.090	83.838	92.846	-	92.846	91.059	95.223	100.271	100.255	Continuing	Continuing
TT3: <i>TECHBASE TECHNOLOGY TRANSITION</i>	-	7.206	7.821	10.765	-	10.765	10.191	11.003	11.033	11.031	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Demonstrates technologies supporting transition to advanced component development. This includes physical capabilities which cover biological and chemical detection, situational awareness and effects modeling, and protection and hazard mitigation. Other major efforts support enhanced chemical detection capabilities for aerosols and non-traditional agents, expanded capabilities for biosurveillance in pathogen detection and diagnosis, and pretreatments and therapeutics against a broader set of chemical and biological agents. Medical capabilities (pretreatments, therapeutics, diagnostics capabilities, and drug manufacturing and regulatory science technologies), include capabilities against non-traditional agents.

In the physical sciences area, Project CB3 focuses on demonstrations of CB defense technologies, including biological detection, chemical detection, information system technology for hazard prediction and systems performance, and protection, and decontamination. The Project continues to pursue solutions against traditional agents.

All non-traditional agent (NTA)-dedicated research (both medical and non-medical) is consolidated in Project NT3. This Project includes NTA chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation.

The medical program in Project TM3, aims to produce biological diagnostic assays and reagents, diagnostic device platforms, pretreatments and therapeutics for bacterial, viral, and toxin threats as well as for chemical threats, and medical devices, as countermeasures for CBR threat agents. Specific areas of medical investigation include: prophylaxis, pretreatment, antidotes and therapeutics, personnel and patient decontamination, and medical management of casualties.

Project TT3, Techbase Technology Transition, pursues efforts to enhance military operational capability, concepts of operation, WMD elimination, and hazard mitigation following a biological warfare or chemical warfare attack.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ATD)</i>
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One function of the CDBP S&T Advanced Technology Development budget is to preserve critical core competencies in the DoD Service laboratories which includes: United States Army Edgewood Chemical Biological Center (ECBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL), among others. The intent is to maintain strategic partnerships with the DoD Service communities for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

The PE is dedicated to conducting proof-of-principle field demonstrations, and testing system-specific technologies to meet specific military needs. Work conducted under this PE will transition to and will provide risk reduction for PE 0603884BP/PE 0604384BP activities.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	140.094	127.941	142.815	-	142.815
Current President's Budget	134.070	127.941	145.359	-	145.359
Total Adjustments	-6.024	0.000	2.544	-	2.544
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-6.024	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	2.544	-	2.544

**Change Summary Explanation**

Funding: N/A

Schedule: N/A

Technical: N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> CB3 / CHEMICAL BIOLOGICAL DEFENSE (ATD)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
CB3: CHEMICAL BIOLOGICAL DEFENSE (ATD)	-	17.141	19.109	18.093	-	18.093	17.585	17.540	17.587	17.585	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project CB3 develops technology advancements for joint service application in the area of information systems and modeling and simulation technologies, protection/hazard mitigation and detection. These activities will speed maturing of advanced technologies to reduce risk in system-oriented integration/demonstration efforts. Information systems advanced technology focuses on areas of advanced warning and reporting, hazard prediction and assessment, simulation analysis and planning, and systems performance modeling. Protection/hazard mitigation works to provide technologies that protect from and reduce the impact of both chemical and biological threats and hazards to the Warfighter, weapons platforms, and structures. Detection strives to develop technologies for point and standoff detection and identification of both chemical and biological agents.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) Expeditionary Collective Protection</p> <p><b>Description:</b> Develop new technologies for soldiers to determine the remaining chemical vapor service life of their chemical warfare agent (CWA) filters.</p> <p><b>FY 2016 Accomplishments:</b> Continued Residual Life Indicator (RLI) satellite filter cartridge system integration and surveillance of prototype RLI filters.</p> <p><b>FY 2017 Plans:</b> Assess performance of optimized RLI satellite filter cartridge. Verify the RLI performance is correlated to that of the carbon bed in a CBRN collective protection filter. Establish the filter bed performance is effectively correlated with the RLI and extended with Guard Bed.</p> <p><b>FY 2018 Plans:</b> Continue filter bed research to investigate how and if various formulation constituents affect coating chemistry and morphology in filter bed. Continue integration and surveillance of Guard Bed and RLI systems.</p>	0.503	0.566	0.722
<p><b>Title:</b> 2) Material Contamination Mitigation</p> <p><b>Description:</b> Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort.</p> <p><b>FY 2016 Accomplishments:</b></p>	1.221	2.230	1.696

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> CB3 / CHEMICAL BIOLOGICAL DEFENSE (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Completed Point-of-Use Formulation (previously named Dial a Decon) effort and transitioned data to the program of record Joint Service General Purpose Decontaminant - Hardened Military Equipment (JSGPD-HME). Initiated laboratory scale development and testing for hot air biological decontamination effort to address sensitive equipment, platform interior, and aircraft decontamination needs, focusing on viral and vegetative bacterial efficacy and using a germinant to reduce the time needed to kill bacterial spores. Initiated laboratory scale development and test for responsive and resistant coatings efforts to enhance decontaminability as part of the systems approach to achieving efficacy goals.</p> <p><b>FY 2017 Plans:</b> Transition sorbent decontaminant formulation effort to advanced development for immediate decontamination, focusing on efficacy testing and final formulation compatibility testing. Initiate room temperature ionic liquid decontaminant effort to address sensitive equipment decontaminant need (enzyme and catalytic) projects, specifically focusing on efficacy testing and formulation. Continue application of data gathered from surface science investigations to inform design to initiate development of the next generation of hazard mitigation technologies that include integration of multiple systems to achieve efficacy goals. Continue enhanced CB survivability and responsive coatings projects to enhance decontaminability as part of the systems approach to achieving efficacy goals. Demonstrate the wide-area decontamination hazard mitigation effort, which focuses on biological spore decontamination in a representative outdoor environment.</p> <p><b>FY 2018 Plans:</b> Complete agent resistant coatings effort and transition to the Air Force Item manager. Continue to optimize the decontamination parameters for the hot air biological decontamination effort to address sensitive equipment, platform interior, and aircraft decontamination needs. Continue and develop the laboratory scale test to optimize decontamination parameters for the chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft chemical warfare agent decontaminant needs. Continue to optimize parameters for responsive and resistant coatings efforts to enhance decontaminability as part of the systems approach to achieving efficacy goals. Continue Wide Area Decontamination of Bacillus anthracis projects, which focus on maturing the biological spore decontamination in a broadened set of outdoor terrains and materials.</p>			
<p><b>Title:</b> 3) Percutaneous Protection</p> <p><b>Description:</b> Develop advanced ensemble prototypes with state-of-the art materials that address the full spectrum of threats and provide a range of solutions optimized for protection, thermal comfort, and mission performance.</p> <p><b>FY 2016 Accomplishments:</b> Continued efforts to engineer and manufacture system integration of multifunctional materials. Developed system integration approaches for incorporation of those materials in protective garments. Continued development of the Integrated Protective Fabric System (IPFS) lightweight ensembles with composite materials and omniphobic coatings optimized for lower thermal burden.</p> <p><b>FY 2017 Plans:</b></p>	2.699	0.453	0.687



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Develop and demonstrate fully integrated ensembles for full-spectrum hazards that support tactical operations for all services. Develop ensembles that include novel garment designs that integrate with body armor, helmet, cooling systems, breathing apparatuses, and combat loads that are scalable to mission demands which will fill a broad set of existing capability gaps for many diverse DoD units.</p> <p><b>FY 2018 Plans:</b> Continue development of Level A/B All Hazards ensembles. Develop and scale up novel materials for protection, emerging SCBA technologies, and novel rebreather technologies. Continue to develop biofeedback parameters for enhanced cooling systems. Initiate the development of biocidal fabrics for personal protection in warfighter ensembles. Continued materials development for multifunctional materials with focus on additional materials development and completing performance evaluations.</p>			
<p><b>Title:</b> 4) Personnel Contamination Mitigation</p> <p><b>Description:</b> Develop new technologies to mitigate the risk associated with contaminated human remains and personnel effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents.</p> <p><b>FY 2017 Plans:</b> Continue to develop new technologies to alleviate the risk associated with contaminated human remains and personnel effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents to support warfighter operations, including the homeland defense mission. This effort also leverages the related BA2 development effort started in FY16.</p>	-	0.085	-
<p><b>Title:</b> 5) Respiratory and Ocular Protection</p> <p><b>Description:</b> Develop novel filtration media that are lighter weight and lower burden while capable of protecting against a broader range of challenges that includes toxic industrial chemicals.</p> <p><b>FY 2016 Accomplishments:</b> Continued efforts to develop, fabricate, and evaluate hybrid system respirator technology prototypes. Transitioned a synthetic nano-structured material focused on toxic industrial chemical removal to the Joint Service General Purpose Mask (JS-GPM).</p> <p><b>FY 2017 Plans:</b> Continue integration of respirator component technologies into a full-spectrum protection system which provides scalable protection. Research and development efforts will include nanotechnologies, anti-fogging materials, dynamic response breathing, oxygen storage and CO2 scrubbing.</p> <p><b>FY 2018 Plans:</b></p>	0.905	0.905	1.136

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Continue to develop new add-on technologies for SCBA and hybrid system respirators. Continue to demonstrate performance envelop of existing air purification technologies towards emerging threats. Continue to develop nano-structured porous materials for air purification.</p> <p><b>Title:</b> 6) Biosurveillance (BSV)</p> <p><b>Description:</b> Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools.</p> <p><b>FY 2017 Plans:</b> Continue biosurveillance analytic evaluations and various analytic capability development, including sequence data sharing, disease reemergence analytics, and pathogen spread visualizations in support of the Joint Program Management Office - Information Systems (JPM-IS). These efforts were developed in FY16 under BA3 TM3 Biological Diagnostics.</p> <p><b>FY 2018 Plans:</b> Complete biosurveillance capabilities aimed at analyzing and facilitating sharing of sequence data, predicting areas of disease reemergence, and visualizing pathogen dynamics in support of the Global Biosurveillance Portal. Initiate the development of analytic applications to acquire, synthesize and interrogate multiple sources of data (open source information, medical diagnostic devices, wearable technology, environmental sensors, unmanned platforms and genomic sequences) to provide high confidence in the prediction and early warning of chemical or biological events.</p>	-	2.643	2.532
<p><b>Title:</b> 7) Detection</p> <p><b>Description:</b> Focuses on the detection and identification of chemical and biological threats in near real-time at a distance from the detector. Future programs focus on the improvement of algorithms, excitation sources, and detector elements to increase range, reduce false positives, increase sensitivity, and reduce cost.</p> <p><b>FY 2016 Accomplishments:</b> Continued sequence based comprehensive identification and characterization platform development for field forward capability.</p> <p><b>FY 2017 Plans:</b> Continue handheld sequencer based platforms for comprehensive identification and characterization for field forward capabilities.</p> <p><b>FY 2018 Plans:</b></p>	4.159	4.066	3.235

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Complete the development of genomic sequencing based platforms protocols for comprehensive identification and characterization for field forward capabilities.				
<p><b>Title:</b> 8) Hazard Prediction</p> <p><b>Description:</b> Improve battlespace awareness by accurately predicting hazardous material releases, atmospheric transport and dispersion, and resulting human effects. Develop predictive capability for the source term of releases of chemical, biological, and industrial materials.</p> <p><b>FY 2016 Accomplishments:</b> Continued implementation of new numerical schemes and performance optimization for transport and dispersion models. Continued enhancement of high-fidelity urban transport and dispersion. Continued configuration management of science and technology prototype to establish upgraded capabilities listed as valid requirements for HPAC/Joint Effects Model (JEM). Continued validation studies for waterborne transport models.</p> <p><b>FY 2017 Plans:</b> Continue implementation of new numerical schemes and performance optimization for transport and dispersion models. Continue enhancement of high-fidelity urban transport and dispersion. Continue configuration management of science and technology prototype to establish upgraded capabilities listed as valid requirements for HPAC/JEM.</p> <p><b>FY 2018 Plans:</b> Continue implementation of new numerical schemes and performance optimization for transport and dispersion models. Continue enhancement of high-fidelity urban transport and dispersion. Continue configuration management of science and technology prototype to establish upgraded capabilities listed as valid requirements for HPAC/JEM. Initiate littoral validation studies for next phase of waterborne transport models.</p>		3.713	3.006	3.551
<p><b>Title:</b> 9) Data Analysis</p> <p><b>Description:</b> Develop chemical, biological, radiological and nuclear data-sharing capabilities. Develop chapters of the Chemical and Biological Warfare Agent Effects Manual Number 1 (CB-1), an authoritative source capturing analytical methods for evaluating the effects of CB warfare agents on equipment, personnel, and operations. Create a framework for implementing CB-1 and provide CBRN defense community access to CB-1.</p> <p><b>FY 2016 Accomplishments:</b> Investigated potential methods for implementation of the CB-1.</p> <p><b>FY 2017 Plans:</b></p>		0.208	0.313	0.029

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue to implement the Chemical and Biological Agent Effects Manual Number 1 (CB-1) on DTRIAC STARS. Provide CBRN defense community access to CB-1.  <b>FY 2018 Plans:</b> Continue to provide CBRN defense community access to CB-1.			
<b>Title:</b> 10) Operational Effects  <b>Description:</b> Develop decision support tools and information management capabilities for planning and real-time analysis to determine and assess operational effects, risks, and overall impacts of CBRN incidents on decision-making. Focus areas include consequence management, population modeling, and knowledge management.  <b>FY 2016 Accomplishments:</b> Continued system performance model (SPM) integration and advanced development for program-wide exploitation for collective and individual protection and contamination avoidance. Continued operational effects research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements setting.  <b>FY 2017 Plans:</b> Continue system performance model integration and advanced development for program-wide exploitation for collective and individual protection and contamination avoidance. Continue operational effects research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements settings.  <b>FY 2018 Plans:</b> Continue operational effects research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements settings. Complete verification and validation of Joint Expeditionary Collective Protection System Performance model and initiate transition of these efforts to the Joint Expeditionary Collective Protection (JECPP) program.	3.733	4.842	4.505
<b>Accomplishments/Planned Programs Subtotals</b>	17.141	19.109	18.093

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: CONTAMINATION AVOIDANCE (ACD&P)	74.684	42.308	29.211	-	29.211	33.181	27.908	20.208	14.131	Continuing	Continuing

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> CB3 / CHEMICAL BIOLOGICAL DEFENSE (ATD)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• DE4: DECONTAMINATION SYSTEMS (ACD&P)	2.753	0.500	9.900	-	9.900	7.477	6.281	12.773	9.539	Continuing	Continuing
• IS4: INFORMATION SYSTEMS (ACD&P)	7.224	5.928	5.941	-	5.941	0.854	0.291	0.075	0.071	Continuing	Continuing
• TE4: TEST & EVALUATION (ACD&P)	11.763	14.887	9.157	-	9.157	6.581	5.170	5.165	3.549	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> NT3 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
NT3: TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)	-	20.633	17.173	23.655	-	23.655	22.893	23.047	28.190	31.291	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project NT3 develops future capabilities against emerging and novel threats and verifies current capabilities against Non-Traditional Agents (NTAs). This project focuses on demonstrating fast and agile scientific responses to enhance or develop capabilities that address emerging threats. Efforts in this project support an integrated approach to develop new or enhanced countermeasures against novel and emerging threats through innovative science and technology (S&T) solutions for detection, protection, decontamination and medical countermeasures (MCMs). Efforts supply test methodologies and supporting science to verify capabilities, develop protection and hazard mitigation options, expand hazard assessment tools, and develop MCMs against NTAs. This project is a comprehensive and focused effort for developing NTA defense capabilities, coordinated with specific interagency partners for doctrine, equipment, and training for the Warfighter and civilian population for defense against NTAs. This project supports advanced technology development of NTA defense science and technology initiatives and transitions them to Budget Activities 4 and 5.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) Diagnostics - Medical</p> <p><b>Description:</b> Focuses on state-of-the-art laboratory/fieldable methods that detect exposure to non-traditional agents in clinical samples. It also targets the identification of biomolecular targets that can be leveraged as analytical methodologies, as well as, laboratory and animal studies characterizing time-course and longevity of a particular analyte/biomarker.</p> <p><b>FY 2016 Accomplishments:</b> Continued development of mature technologies that can quickly diagnose pre-symptomatic NTA exposure. Continued transition method development for identification and validation of NTAs in clinical samples to the Laboratory Response Network. All efforts transition to TM3 (Techbase Med Defense)/Assays and Reagents in FY17.</p>	0.606	-	-
<p><b>Title:</b> 2) Material Contamination Mitigation</p> <p><b>Description:</b> Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort.</p> <p><b>FY 2016 Accomplishments:</b> Completed Point-of-Use Formulation (previously named Dial a Decon) effort and transitioned data, including NTA efficacy data to the Joint General Purpose Decontaminant - Hardened Military Equipment program of record. Initiated laboratory scale</p>	0.714	1.585	1.115

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
development and testing for zirconium hydroxide (Zr(OH) <sub>4</sub> ) to meet warfighter immediate and operational NTA decontamination needs. Integrated NTAs, including newly identified emerging threats, into all material contamination mitigation projects.  <b>FY 2017 Plans:</b> Continue integration of a Government owned decontaminant formulation system, specifically addressing other classes of emerging threats. Integrate NTAs into the continuing responsive coatings projects to enhance decontaminability as part of the systems approach to achieving efficacy goals. Complete NTA efficacy testing for primary and other emerging threat NTAs to support the transition of the sorbent decontamination formulation effort. Examine room temperature ionic liquid decontaminant efficacy against representative agents from three categories of NTAs.  <b>FY 2018 Plans:</b> Continue development and optimization of the full range of NTAs into the material contamination mitigation portfolio. Integrate NTA testing into hot air decontamination effort to address sensitive equipment, platform interior, and aircraft NTA decontaminant needs. Continue responsive coatings development and optimization to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals. Continue optimization efforts to develop/enhance NTA mapping (disclosure/assurance) technologies.				
<b>Title:</b> 3) Personnel Contamination Mitigation  <b>Description:</b> Develop new technologies to mitigate the risk associated with contaminated human remains and personnel effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents.  <b>FY 2017 Plans:</b> Continue exploring combinations of complementary technologies to reduce the NTA contamination hazard faster with less outside support and develop revolutionary prototype systems that sense, respond, and signal contamination to support warfighter operations, including homeland defense mission; specifically, advancing formulation options and concepts of operations that include efficacy testing for multiple classes of NTAs.  <b>FY 2018 Plans:</b> Transition technology data developed by efforts to develop an alternative to RSDL, including efficacy data against representative NTAs and continue effort to develop a new personnel contamination mitigation formulation (decontaminant). Initiate personnel decontamination efforts to enhance current processes and support mass casualty personnel decontamination warfighter operations, including homeland defense mission, including efficacy data against representative NTAs.		-	0.623	0.807
<b>Title:</b> 4) Respiratory and Ocular Protection		0.693	0.226	0.357

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Development and analysis of design alternatives for chemical and biological air-purifying respirators that provide enhanced protection with lower physiological burden and improved interface with mission equipment.</p> <p><b>FY 2016 Accomplishments:</b> Initiated efforts to investigate performance limitations of current and developmental respiratory protection systems against NTA challenges and investigate counter-measures to these specific limitations.</p> <p><b>FY 2017 Plans:</b> Continued to investigate performance limitations current and developmental of respiratory protection systems against NTA challenges and investigate counter-measures to these specific limitations.</p> <p><b>FY 2018 Plans:</b> Continue to develop closed circuit SCBA and novel respirator technologies against NTA challenges.</p>			
<p><b>Title:</b> 5) Pretreatments - Medical</p> <p><b>Description:</b> Develop pretreatments and prophylactics that provide protection against NTAs and emerging chemical threats. Prophylactic bioscavengers should rapidly bind and detoxify a broad spectrum of compounds of interest (COIs).</p> <p><b>FY 2016 Accomplishments:</b> Completed efforts to demonstrate proof-of-concept for IM and pulmonary delivery of a stoichiometric bioscavenger. Completed effort on alternate manufacturing processes for rBuChE (recombinant butyryl cholinesterase). Demonstrated impact of the ADMET CoE across multiple medical countermeasure product development efforts to provide in vitro data early in the candidate identification and downselection process.</p> <p><b>FY 2017 Plans:</b> Continue studies to advance recombinant bioscavenger MCM through established animal models and pre-IND efforts.</p> <p><b>FY 2018 Plans:</b> Initiate preclinical studies for adeno associated virus expressed BuChE. Continue to explore whether OPNA scavengers administered as a post-exposure therapy (either pre- and/or post-symptomatic) affords desired protection. Continue efforts to determine whether co-administration of standard therapy, in conjunction with OPNA scavengers, is substantially more effective after onset of signs of intoxication.</p>	6.649	2.129	5.164
<p><b>Title:</b> 6) Therapeutics - Medical</p> <p><b>Description:</b> Efforts in this area support the confirmation of mechanisms of action for NTAs and emerging chemical threats by probable routes of field exposure and seek to refine standard experimental routes in order to identify/assess targets for</p>	1.872	1.217	3.175



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
therapeutic development. Physiological parameters and pathological assessments will be used to establish the general mode and mechanisms of toxicity required for therapeutic development.				
<p><b>FY 2016 Accomplishments:</b> Supported enabling technology to facilitate delivery of therapeutic regimen to the brain. Evaluated compounds in high-throughput in vitro screens for reactivation of cholinesterases in relevant species. Separated enantiomers of novel therapeutic and performed experiments to determine which isomer should be further developed as a medical countermeasure. Developed in vivo microdialysis assay to measure cholinesterase function in brain and effects of centrally active reactivators. Continued to refine and validate small animal models to support FDA licensure.</p> <p><b>FY 2017 Plans:</b> Continue support of enabling technology to facilitate delivery of therapeutics to the brain. Continue to validate small animal models to support FDA licensure of therapeutics used in the treatment of NTA exposures.</p> <p><b>FY 2018 Plans:</b> Continue to enable technologies to deliver therapeutics to the brain. Continue evaluating novel therapeutics using high-throughput in vitro screens. Continue lead optimization on novel therapeutic compounds. Continue validating animal models for use in NTA exposure studies.</p>				
<p><b>Title:</b> 7) Detection</p> <p><b>Description:</b> Detection NTA: Focuses on technologies to provide NTA detection capabilities.</p> <p><b>FY 2016 Accomplishments:</b> Continued integration studies for Next Generation Chemical Detector (NGCD) Variant 1 based on Micro Electro-Mechanical Systems components for Gas Chromatography and Mass Spectrometry. Completed the development of test methodology to validate signatures for chemical aerosol threat materials, including traditional and non-traditional agents, and toxic industrial chemicals. Completed the transfer of validated signatures into the NGCD Variant 2.</p> <p><b>FY 2017 Plans:</b> Complete integration studies and prototype delivery for transition to NGCD based on Micro Electro-Mechanical Systems components for Gas Chromatography and Mass Spectrometry.</p> <p><b>FY 2018 Plans:</b></p>		8.569	10.351	11.840

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue the advanced development and rapid prototyping of chemical sensors for persistent sensing and chemical reconnaissance applications. Complete and transition the developed low-cost chemical detection capability utilized for identification of liquid threats.				
<p><b>Title:</b> 8) Modeling &amp; Simulation</p> <p><b>Description:</b> This effort develops NTA technology advancements for joint service application in the area of information systems and modeling and simulation technologies. These activities will speed maturation of advanced technologies to reduce risk in system-oriented integration/demonstration efforts. Information systems advanced technology focuses on areas of advanced warning and reporting, hazard prediction and assessment, simulation analysis and planning, and systems performance modeling.</p> <p><b>FY 2016 Accomplishments:</b> Continued system performance model integration and development for program-wide exploitation for decontamination.</p> <p><b>FY 2017 Plans:</b> Continue sensitivity and validation studies on NTA source term models and update and expand NTA databases.</p> <p><b>FY 2018 Plans:</b> Continue system performance model integration and development for program-wide exploitation for decontamination.</p>		0.204	0.240	0.238
<p><b>Title:</b> 9) Percutaneous Protection</p> <p><b>Description:</b> Develop advanced ensemble prototypes with state-of-the art materials that address the full spectrum of threats and provide a range of solutions optimized for protection, thermal comfort, and mission performance.</p> <p><b>FY 2016 Accomplishments:</b> Completed NTA evaluation and testing of IPFS lightweight ensembles.</p> <p><b>FY 2018 Plans:</b> Initiate evaluation of multifunctional systems for protection in relevant configurations at scale. Continue integration, engineering, and scaling of CB relevant multifunctional materials and garment configurations.</p>		0.650	-	0.157
<p><b>Title:</b> 10) Test &amp; Evaluation</p> <p><b>Description:</b> Develops test and evaluation technologies and processes in support of NTA activities.</p> <p><b>FY 2016 Accomplishments:</b> Completed methodology and protocol development to support the evaluation of Next Generation Chemical Detector technologies.</p> <p><b>FY 2017 Plans:</b></p>		0.676	0.802	0.802

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> NT3 / TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Initiate rapid prototyping and evaluation of chemical detection platforms.			
<b>FY 2018 Plans:</b> Continue rapid prototyping and evaluation of chemical detection platforms.			
<b>Accomplishments/Planned Programs Subtotals</b>	20.633	17.173	23.655

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• CA4: CONTAMINATION AVOIDANCE (ACD&P)	74.684	42.308	29.211	-	29.211	33.181	27.908	20.208	14.131	Continuing	Continuing
• DE4: DECONTAMINATION SYSTEMS (ACD&P)	2.753	0.500	9.900	-	9.900	7.477	6.281	12.773	9.539	Continuing	Continuing
• IP4: INDIVIDUAL PROTECTION (ACD&P)	5.473	3.235	5.145	-	5.145	2.000	1.000	0.000	0.000	0	16.853
• MC4: MEDICAL CHEMICAL DEFENSE (ACD&P)	1.060	5.681	5.165	-	5.165	2.790	4.675	3.975	7.098	Continuing	Continuing
• TE4: TEST & EVALUATION (ACD&P)	11.763	14.887	9.157	-	9.157	6.581	5.170	5.165	3.549	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)				<b>Project (Number/Name)</b> TM3 / TECHBASE MED DEFENSE (ATD)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
TM3: <i>TECHBASE MED DEFENSE (ATD)</i>	-	89.090	83.838	92.846	-	92.846	91.059	95.223	100.271	100.255	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project TM3 supports preclinical and early phase clinical development of vaccines, therapeutic drugs, and diagnostic capabilities to provide safe and effective medical defense against validated biological threat agents or emerging infectious disease biothreats including bacteria, toxins, and viruses. Innovative biotechnology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat disease due to exposure to biological threat agents will be evaluated. In addition this project supports the advanced development of medical countermeasures to include prophylaxes, pretreatments, antidotes, skin decontaminants and therapeutic drugs against identified and emerging chemical warfare threat agents. Entry of candidate vaccines, therapeutics, and diagnostic technologies into advanced development is facilitated by the development of technical data packages that support the Food and Drug Administration (FDA) Investigational New Drug (IND) processes, DoD acquisition regulations, and the oversight of early phase clinical trials in accordance with FDA guidelines.

The Medical Countermeasures Initiative (MCMI) was established to coordinate inter-related advanced development and flexible manufacturing capabilities, and these efforts within science and technology (S&T) have been concentrated in advancing two areas: 1) regulatory science and 2) flexible manufacturing technologies and processes for MCMs. These MCMI efforts are enablers supporting the DoD Medical Countermeasures Advanced Development and Manufacturing (MCM-ADM) capability. The focus of these efforts is unchanged, but starting in FY17 all MCMI efforts under TM3 are transitioned into Bacterial Therapeutics to reduce budget management complexity and highlight the range of MCM efforts ongoing with the ADM.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) Assays and Reagents	11.335	16.488	25.878
<b>Description:</b> Development and verification of rapid, sensitive, and specific tests for the identification of BWAs and their expressed pathogens and toxins in clinical specimens from Warfighters for the diagnosis of exposure/infection. Discovery of host biomarkers generated in response to exposure to biological threat agents.			
<b>FY 2016 Accomplishments:</b> Initiated efforts and studies on host response biomarker classifiers. Completed the development of 50 multi-plex assays utilizing the MAGPIX format (multiplexing platform capable of performing qualitative and quantitative analysis) for the detection of Burkholderia pseudomallei and its near neighbors. Completed process to extend Republic of Korea (ROK) Project Agreement to include a Phase II. Transitioned thirty-three molecular transition packages (MTP) to the Defense Biological Product Assurance Office (DBPAO). Transitioned 888 genomic sequences for Burkholderia pseudomallei and its near neighbors to Next Generation Diagnostics System, Increment 1 (NGDS Inc 1). Transitioned Nucleic Acid-Programmable Protein Array and clone library data for Vaccinia virus to DBPAO. Transitioned clinical laboratory improvement amendments (CLIA)-Waived protocols for the FilmArray Respiratory Panel to NGDS Inc 1. Transitioned genomic sequence data for Crimean -Congo hemorrhagic fever, Makona			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> TM3 / TECHBASE MED DEFENSE (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>and Kikwit Ebola virus, and a number of hemorrhagic fever viruses to DBPAO. Transitioned biomedical informatics platform Empowering the Development of Genomics Expertise (EDGE) version 1.1 to Global Biosurveillance Technology Initiative (GBTI).</p> <p><b>FY 2017 Plans:</b> Continue the development and production of thermostable reagents. Continue the development of assays and technologies for biothreat agent detection and characterization. Continue verification and testing performance of biomarker assays and reagents for point-of-need diagnostic platforms. Continue to optimize pipelines to improve unbiased pathogen discovery and/or detection in clinical and environmental samples. Continue optimization and enhancement of updated bioinformatics platform to support genomic and clinical informatics. Evaluate optimization and enhancement of updated bioinformatics platform in the field including efforts in the ROK.</p> <p><b>FY 2018 Plans:</b> Continue efforts and studies on host response biomarker classifiers. Continue the development and production of thermostable reagents. Continue the development of assays and technologies for biological and chemical agent detection and characterization. Continue verification and testing performance of biomarker assays and reagents for point-of-need diagnostic platforms. Continue to optimize pipelines to improve unbiased pathogen discovery and/or detection in clinical and environmental samples. Continue optimization and enhancement of updated bioinformatics platform to support genomic and clinical (biomedical) informatics. Continue evaluating optimization and enhancement of updated bioinformatics platform in the field including efforts in the ROK. Initiate investigations to mature chemical and/or NTA diagnostic assays for use in forward field settings or at point-of-need. Initiate efforts to integrate or converge platform technologies to detect antimicrobial resistance/multidrug resistant (AMR/MDR) microbes at the single molecular level. Initiate incorporation of stability and pre-clinical studies for diagnostic assays in development to further support pre-EUA submissions.</p>			
<p><b>Title:</b> 2) Bacterial Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate potential therapeutic compounds effective against bacterial threat agents.</p> <p><b>FY 2016 Accomplishments:</b> Conducted evaluation of an FDA approved compound for efficacy in pivotal GLP NHP studies against an aerosolized challenge of F. tularensis in support of submission of a supplemental new drug application (sNDA) under the Animal Rule. Down selected between novel ribosome inhibitors and a novel topoisomerase inhibitor as therapeutics for priority bacterial pathogens. Continued non-clinical research required to submit IND applications to the FDA for additional products. Continued supportive pivotal GLP studies to further the advancement of both novel and approved therapeutics for limited priority pathogen indications under the Animal Rule.</p> <p><b>FY 2017 Plans:</b></p>	8.698	16.033	19.386

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> TM3 / TECHBASE MED DEFENSE (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Expand evaluation of FDA approved compounds for efficacy in pivotal GLP non-human primate models against aerosolized challenge of Yersinia pestis, Bacillus anthracis, or Francisella tularensis in support of submission of a sNDA under the Animal Rule. Combinatorial testing of FDA approved drugs for efficacy and decreased development of resistance. Submission of an IND to the FDA for a small molecule inhibitor for the treatment of Burkholderia pseudomallei. Continue non-clinical research to advance additional therapeutic products with the goal of submission of an IND to the FDA. Work previously funded under TM3/MCMI to evaluate and develop platforms for enablers of the advanced development of medical countermeasures will be continued here.</p> <p><b>FY 2018 Plans:</b> Initiate multiple efforts to advance candidate therapeutics, with a focus on non-traditional candidates, through preclinical evaluation toward IND and phase I clinical studies. Establish optimal dosing regimen of novel orally-delivered therapeutic in models of B. pseudomallei infection. Continue strategy to engage industry in the development of therapeutics for BWA indications through the evaluation of late development and/or FDA approved compounds for efficacy in pivotal GLP NHP models against aerosolized challenge of Yersinia pestis, Bacillus anthracis, or Francisella tularensis in support of submission of a sNDA under the Animal Rule.</p>			
<p><b>Title:</b> 3) Bacterial/Toxin Vaccines</p> <p><b>Description:</b> Evaluate the best single agent bacterial and toxin vaccines for effectiveness against aerosol challenge in large animal models.</p> <p><b>FY 2016 Accomplishments:</b> Initiated transition of ricin vaccine. Utilized ongoing clinical work to support generation of monoclonal antibodies against ricin toxin. Demonstrated proof-of-concept efficacy for lead Tularemia Vaccine in nonhuman primate model. Continued development of a monoclonal antibody-based pretreatment against botulinum neurotoxins. Explored technology transfer of manufacturing to a suitable long-term manufacturing partner. Developed and evaluated bridging strategies for interim fielding capability readiness.</p> <p><b>FY 2017 Plans:</b> Conduct feasibility studies to assess efficacy of lead type A Francisella tularensis (Tularemia) vaccine prototypes. Demonstrate feasibility and efficacy of combinations of vaccines designed with different antigens to protect against aerosolized, engineered pathogens in animal models. Assess feasibility of prototype oral Bacillus anthracis (anthrax) vaccines in small animal model. Complete tri-target and penta-target formulations of monoclonal antibody-based pretreatment against botulinum neurotoxin. Continue studies utilizing human monoclonal antibodies against ricin toxin in assay development and post-exposure prophylaxis models.</p> <p><b>FY 2018 Plans:</b></p>	6.393	15.698	17.724

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Complete initial T cell and B cell antigen discovery for Q Fever vaccine design and testing. Continue evaluation of live attenuated Tularemia vaccine candidates. Evaluate efficacy of mucosal delivery of ricin monoclonal antibody against ricin toxin in relevant animal model. Evaluate efficacy of next generation anthrax vaccine in combination with Protective-antigen (PA)-based vaccine in relevant animal models. Identify mechanism of immunity of next generation anthrax vaccine. Continue evaluation and manufacturing development of Burkholderia OMV vaccine. Complete botulinum toxin mAb manufacturing development and release assay development. Manufacture product for clinical trials. Initiate new manufacturing and formulation studies and continue IND enabling preclinical animal modeling and GLP safety evaluation of bot mAb's.</p>				
<p><b>Title:</b> 4) Biosurveillance</p> <p><b>Description:</b> Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools.</p> <p><b>FY 2016 Accomplishments:</b> Completed the development and testing of a fieldable "smart trap" for long-term autonomous surveillance of arboviruses. Continued the development of the BSV Ecosystem to include analyst collaboration tools, advanced analytics, and analyst workbench. Continued the development of various biosurveillance analytic capabilities including a surveillance window app (SWAP), a suite of five epidemiological tools for integration into the BSV Ecosystem, and a BSV Ecosystem evaluation support capability. Completed OCONUS clinical testing of first set of devices initially established during the 24 Month Challenge and identified the second set of devices, including new platforms and assay, that will be deployed to the OCONUS sites for clinical testing.</p> <p><b>FY 2017 Plans:</b> Complete the development of the BSV Ecosystem platform to include analyst collaboration tools, advanced analytics, and analyst workbench. Complete the development of various biosurveillance analytic capabilities including a SWAP, and a suite of epidemiological forecasting and prediction tools. Continue the field forward diagnostic evaluation capability to assess technical feasibility and limitations of deploying point of need diagnostics in austere environments.</p> <p><b>FY 2018 Plans:</b> Devices will continue to be tested at the OCONUS sites and data will be submitted to the BSVE and DTRA for analysis.</p>		9.264	4.552	4.326
<p><b>Title:</b> 5) Chemical Diagnostics</p>		0.342	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> TM3 / TECHBASE MED DEFENSE (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Focuses on state-of-the-art laboratory/fieldable methods that detect exposure to chemical warfare agents (CWA) (e.g., nerve agents and vesicants) in clinical samples. It also targets the identification of biomolecular targets that can be leveraged as analytical methodologies, as well as laboratory and animal studies characterizing time-course and longevity of a particular analyte/biomarker.</p> <p><b>FY 2016 Accomplishments:</b> Continued the current set of analytical methods to more sensitive analytical platforms for the detection of CWAs in clinical samples. All efforts transition to TM3 (Techbase Med Defense)/Assays and Reagents in FY17.</p>			
<p><b>Title:</b> 6) Diagnostic Device Platforms</p> <p><b>Description:</b> Diagnostic device development to include systems able to harness next generation technologies to revolutionize clinical diagnostics in care facilities and in hospital laboratories. This investment will incorporate capabilities such as next generation sequencing and advanced biomolecular methods to harness both host and pathogen biomarkers in a threat agnostic approach that will serve all echelons of military medical care. Technology transitions to the Next Generation Diagnostic System.</p> <p><b>FY 2016 Accomplishments:</b> Continued to develop candidate devices for potential transition to support the development of point of care diagnostic capabilities. Continued development of hardware solutions and assay formats to enable point of need diagnostic capabilities. Continued to verify clinical utility of host and pathogen biomarkers and integrate onto diagnostic platform prototypes that confer(s) the ability to identify and type novel infectious agents as a function of their relationship to previously characterized pathologies. Continued sequence based comprehensive identification and characterization platform development for field forward capability.</p> <p><b>FY 2017 Plans:</b> Continue developing point-of-need diagnostic platforms with host biomarker diagnostic assays and testing performance. Continue evaluating metrics of host-based diagnostics with pathogen detection approaches in analytical and/or clinical environments. Complete the development of candidate devices for potential transition to support the development of point of care diagnostic capabilities, and initiate the verification and test validation for these candidate devices. Continue development of hardware solutions and assay formats to enable point of need diagnostic capabilities. Continue genomic-based and initiate proteomic-based comprehensive identification and characterization platform development for field forward capabilities. Continue optimization and enhancement of updated bioinformatics platform to support genomic and clinical informatics.</p> <p><b>FY 2018 Plans:</b> Continue developing point-of-need diagnostic platforms with host biomarker diagnostic assays and testing performance. Continue evaluating metrics of host-based diagnostics with pathogen detection approaches in analytical and/or clinical environments.</p>	19.149	16.354	8.482



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue genomic-based and proteomic-based comprehensive identification and characterization platform development for field forward capabilities. Continue high sensitivity immunoassay and protein detection platforms for clinical samples.			
<p><b>Title:</b> 7) Medical Countermeasures Initiative</p> <p><b>Description:</b> The MCMI will integrate the regulatory science and manufacturing technologies and processes developed into the Advanced Development and Manufacturing (MCM-ADM) as enablers of the advanced development and flexible manufacturing capability.</p> <p><b>FY 2016 Accomplishments:</b> Continued development of human in vitro immune mimetic assays for FDA acceptance to enable rapid and accurate prediction of the human response to experimental vaccines and other MCMs. Continued to develop and make practical improvements to existing agile, flexible, manufacturing bioprocesses for the purpose of accelerating access to biodefense MCMs. Continued to develop agile, flexible manufacturing processes that are amenable to the DoD Advanced Development and Manufacturing capability (ADMc). All efforts transitioned to TM3 (Techbase Med Defense)/Bacterial Therapeutics in FY17.</p>	9.467	-	-
<p><b>Title:</b> 8) Neurologic Therapeutics</p> <p><b>Description:</b> Focuses on therapeutic strategies to effectively minimize neurologic injuries resulting from exposure to chemical warfare agents (CWA). This effort involves the development of neuroprotectants, anticonvulsants, and improved therapies for brain enzyme reactivation. Supports eventual Food and Drug Administration (FDA) licensure of new compounds or to identify licensed products for use in the treatment of chemical warfare casualties.</p> <p><b>FY 2016 Accomplishments:</b> Established high-throughput, in vitro assays to test known therapeutics for reactivation capability of cholinesterase inhibited by selected NTAs. Initiated development of real-time microdialysis system to monitor behavior of animal treated with reactivators. Initiated proof of concept, in vivo experiments to monitor neuroprotective properties of therapeutics. Maintained ADMET CoE to ensure capability for supporting regulatory science to facilitate FDA licensure.</p> <p><b>FY 2017 Plans:</b> Maintain the ADMET CoE partnership and capability to ensure capability for development of and supporting regulatory science to facilitate FDA licensure of chemical therapeutics.</p> <p><b>FY 2018 Plans:</b></p>	1.064	0.405	0.397

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue optimizing real-time microdialysis system. Continue using proof-of-concept in vivo experiments to measure neuroprotective effects of known and novel compounds. Continue maintaining the ADMET CoE to ensure capability for development and supporting regulatory science to facilitate FDA licensure of chemical therapeutics.			
<p><b>Title:</b> 9) Toxin Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate potential therapeutic candidates effective against biological toxin threat agents.</p> <p><b>FY 2016 Accomplishments:</b> Completed characterization and evaluation of humanized pentavalent antibody cocktail to prevent and/or treat BoNT intoxication, advancing to preclinical studies. Completed testing of novel small molecule inhibitors in NHP model of BoNT A intoxication for efficacy. Finalized preclinical studies to advance antibody based therapeutic for staphylococcal enterotoxin B intoxication into phase I clinical trials.</p>	1.961	-	-
<p><b>Title:</b> 10) Vaccine Platforms and Research Tools</p> <p><b>Description:</b> Use novel technology and methods to support development of vaccine candidates. Conduct studies to determine potential immune interference between lead vaccine candidates, the effect of alternative vaccine delivery methods, and thermo-stabilization technologies on the efficacy of lead vaccine candidates. Identify correlates of protection in humans, and predict the success of lead vaccine candidates in humans.</p> <p><b>FY 2016 Accomplishments:</b> Maintained studies that utilize clinical samples from Filovirus outbreaks in multiple international locations to refine definition of clinically relevant correlates of immunity. Evaluated novel adjuvants as platforms for utilization in biodefense vaccines. Developed and evaluated bridging strategies for interim fielding capability readiness.</p> <p><b>FY 2017 Plans:</b> Down-select target antigens based on immunogenicity for Yersinia pestis (plague), Coxiella (Q-fever) and other relevant indications for production in plant-based vaccine platform. Continue platform vaccine assessment activities: Explore antigen candidates for type A Francisella tularensis (Tularemia) using the RNActive vaccine platform technology. (Moved from TM3 - MCMI.) Further evaluate and define the DNA-based and nanoparticle vaccine platforms and targeted vaccine delivery systems. (Transitioned from TM2 - Vaccine Platforms and Research Tools.)</p> <p><b>FY 2018 Plans:</b> Continue identification of bio-physiologic markers of alphavirus infection in NHPs. Continue development of OMV and nanoparticle vaccine platforms targeting Burkholderia and Francisella. Initiate development of native conformation membrane protein</p>	6.614	2.610	2.948

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
expression and presentation system. Select Venezuelan equine encephalitis virus (VEEV) and Eastern equine encephalitis virus (EEEV) formulations for advancement to next round of clinical studies.			
<p><b>Title:</b> 11) Viral Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate potential therapeutic candidates effective against designated viral threat agents.</p> <p><b>FY 2016 Accomplishments:</b> Evaluated immunotherapies for alphaviruses in small animal and NHP models. Continued a repurposing screening program to determine the efficacy of FDA approved compounds against emerging infectious diseases. Continued pre-clinical research required to submit IND applications to the FDA for additional products or additional product indications to refresh the viral therapeutics product pipeline.</p> <p><b>FY 2017 Plans:</b> Continue to develop and evaluate broad spectrum therapies against various strains of alphaviruses. Evaluate human plasma from people exposed to the Sudan strain of Ebola to optimize a monoclonal or polyclonal cocktail for use as a prophylactic. Support diagnostic evaluation of clinical samples from West Africa to assess the efficacy of immune plasma from Ebola survivors as a potential treatment.</p> <p><b>FY 2018 Plans:</b> Initiate small molecule and monoclonal antibody selection and evaluation in large NHP models for pan-ebola/ pan-filovirus and alphaviral therapeutic applications. Test efficacy of hemofiltration for treatment of cytokine-induced shock from filoviral infection. Continue monoclonal antibody development for broad spectrum capabilities.</p>	6.870	6.198	7.495
<p><b>Title:</b> 12) Viral Vaccines</p> <p><b>Description:</b> Evaluates the best vaccine candidates for Alphaviruses and Filoviruses for effectiveness and duration of protective immune response against aerosol challenge in large animal models. Animal models will be developed to support FDA licensure of mature vaccine candidates.</p> <p><b>FY 2016 Accomplishments:</b> Continued to support Alphavirus and Filovirus vaccine candidates by determining correlates of protective immunity. Continued natural history studies for Alphaviruses (W/E/VEEV) to fulfill future FDA 'Animal Rule' requirements necessary for vaccine licensure. Demonstrated proof-of-concept safety and immunogenicity with a monovalent Filovirus vaccine candidate. Developed and evaluated bridging strategies for interim fielding capability readiness.</p> <p><b>FY 2017 Plans:</b></p>	7.933	5.500	6.210

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue studies toward the development of Alphavirus and Filovirus vaccine candidates. Develop multivalent Filovirus vaccine for Zaire and Sudan Ebolavirus and Marburg Marburgvirus, building on the Ebola Zaire vaccine (rVSV, ZEBOV) platform and experience. Continue FDA requested biodistribution and non-human primate efficacy studies for FDA Animal Rule licensure of the Ebola rVSV ZEBOV vaccine. Explore calibrated non-human primate animal models and challenges for Alphaviruses (W/E/VEEV). Continue non-clinical and clinical development of a Venezuelan equine encephalitis virus (VEEV) DNA vaccine. Explore accelerated pathways for VEEV DNA vaccine development [moved from TM2/Viral/Bacterial/Toxins Vaccines].			
<b>FY 2018 Plans:</b> Continue manufacturing and formulation development for Alphavirus (WEVEE) vaccines. Continue assay development for Western, Eastern, and Venezuelan Equine Encephalitis Virus vaccines. Finalize manufacturing and assay development for vesicular stomatitis virus (VSV) trivalent Filovirus vaccine. Continue nonclinical and clinical safety development of trivalent filovirus vaccine covering Zaire Ebolavirus, Sudan Ebolavirus and Marburg Marburgvirus. Finalize animal model validation for filovirus vaccine licensure.			
<b>Accomplishments/Planned Programs Subtotals</b>	89.090	83.838	92.846

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB4: MEDICAL BIOLOGICAL DEFENSE (ACD&P)	68.160	65.648	83.999	-	83.999	73.090	35.432	26.460	13.317	Continuing	Continuing
• MC4: MEDICAL CHEMICAL DEFENSE (ACD&P)	1.060	5.681	5.165	-	5.165	2.790	4.675	3.975	7.098	Continuing	Continuing
• MB5: MEDICAL BIOLOGICAL DEFENSE (EMD)	80.412	106.223	136.553	-	136.553	107.315	141.385	170.160	146.138	Continuing	Continuing
• MC5: MEDICAL CHEMICAL DEFENSE (EMD)	64.773	39.504	47.388	-	47.388	62.092	38.576	40.607	31.746	Continuing	Continuing
• MB7: MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)	8.541	7.145	11.950	-	11.950	9.850	3.728	6.060	6.532	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ATD)</i>	<b>Project (Number/Name)</b> TM3 / <i>TECHBASE MED DEFENSE (ATD)</i>

<b>E. Performance Metrics</b> N/A
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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)				<b>Project (Number/Name)</b> TT3 / TECHBASE TECHNOLOGY TRANSITION			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
TT3: TECHBASE TECHNOLOGY TRANSITION	-	7.206	7.821	10.765	-	10.765	10.191	11.003	11.033	11.031	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Project TT3 validates high-risk/high-payoff technologies, concepts-of-operations, and a Joint Combat Developer concept development and experimentation process that could significantly improve Warfighter capabilities in preparation for transition of mature technologies to advanced development programs requiring chemical and biological (CB) defense technologies. These programs offer an opportunity to identify and efficiently mature emerging technologies including limited objective experiments, laboratory experiments, risk reduction efforts, engineering and integration. These demonstrations and programs seek to demonstrate the potential for enhanced military operational capability and/or cost effectiveness. Upon conclusion of the technical and operational demonstrations, the user or sponsor provides a determination of the military utility and operational impact of the technology and capability demonstrated. Successfully demonstrated technologies with proven military utility can remain in place for future extended user evaluations, accepted into the advanced stages of the formal acquisition process, proceed directly into limited or full-scale production or be returned to the technical base for further development. This project addresses four family of products areas: Biological Resiliency, to include Biosurveillance; Integrated Early Warning, to include Remote Detection; Chemical and Biological Warfare Agent Destruction and Disablement; and Hazard Mitigation. Biological resiliency efforts are targeted to reduce biological threats. Integrated Early Warning is conducted through a coordinated program approach focused on layering Chemical and Biological Detection technologies and integrating CB threat indicators with rapid response actions. WMD Disablement and Destruction addresses detection, identification, verification and baseline assessments in support of expeditionary forces deployed in non-permissive environments. Hazard Mitigation addresses Chemical, Biological, and Radiological (CBR) remediation and decontamination processes.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) Experiment & Technology Demonstrations	7.206	7.821	10.765
<p><b>Description:</b> Project TT3 validates high-risk/high-payoff technologies and concepts-of-operations through the use of the Advanced Technology Demonstration (ATD), Rapid Military Utility Assessment (RMUA) processes and Warfighter Integration Demonstration, Joint Exercise and Transition initiative. The RMUA is a formal development and experimentation process with the Maneuver Support Center of Excellence (MSCOE) and the Joint Combat Developer that enables both material and non-material solutions. The Warfighter Integration initiative supports Combating WMD missions through the identification and integration of innovative technologies to demonstrate new capabilities via an agile, short-timeline (6-12 month) to enable transition of mature technologies to Advanced Component Development and Prototype programs. This project addresses enterprise priority areas of Early Warning and Integrated &amp; Layered Defense.</p> <p><b>FY 2016 Accomplishments:</b> Evaluated prototypes and existing technologies for disablement activities in support of key operational planning scenarios. For the DoD/DHS collaborative biosurveillance ATD, completed technology and CONOPS/TTP development and system integration of information systems for the whole of Government and demonstrated system operation. Continued to conduct rapid military utility</p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603384BP / CHEMICAL/BIOLOGICAL DEFENSE (ATD)	<b>Project (Number/Name)</b> TT3 / TECHBASE TECHNOLOGY TRANSITION

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>assessments and field experiments process to assess early technology capability contributions, in collaboration with the CBDP Joint Combat Developer and with outcomes to support warfighter requirements and capability development. Initiated risk reduction activities for a comprehensive early warning ATD in FY17. Began development of an architecture for the integration of sensor and mobile platforms along with methods of information sharing to enable early warning in forward deployed locations.</p> <p><b>FY 2017 Plans:</b> Continue to develop and demonstrate prototypes and technologies for the WMD expeditionary disablement ATD which will address WMD rapid disablement and destruction program area in support of key operational planning scenarios. Initiate S&amp;T integration activities for CB sensor technologies onto mobile platforms as part of the comprehensive early warning ATD. Conduct risk reduction activities for the development and integration of wearable sensors as part of the comprehensive early warning ATD. Continue to conduct rapid military utility assessments and field experiments to assess early technology capability contributions, in collaboration with the CBDP Joint Combat Developer. Continue risk reduction activities through baseline assessments in preparation for a mass casualty decontamination and medical support ATD.</p> <p><b>FY 2018 Plans:</b> Initiate situational understanding at the tactical level for the comprehensive early warning ATD. Continue S&amp;T integration activities for CB sensor technologies onto mobile platforms as part of the second phase of the comprehensive early warning ATD. Begin integration of wearable sensors as Phase 3 of the comprehensive early warning ATD. Continue transition activities with JPEO early warning ECD. Continue to conduct rapid military utility assessments and field experiments to assess early technology capability contributions, in collaboration with the CBDP Joint Combat Developer. Initiate Warfighter Integration activities through baseline demonstrations and assessments in support of Integrated &amp; Layered Defense.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	7.206	7.821	10.765

**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-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	171.117	138.187	148.518	-	148.518	103.731	75.389	83.457	96.132	Continuing	Continuing
CA4: <i>CONTAMINATION AVOIDANCE (ACD&amp;P)</i>	-	74.684	42.308	29.211	-	29.211	39.631	26.931	22.935	13.703	Continuing	Continuing
DE4: <i>DECONTAMINATION SYSTEMS (ACD&amp;P)</i>	-	2.753	0.500	9.900	-	9.900	9.156	15.301	16.269	17.768	Continuing	Continuing
IP4: <i>INDIVIDUAL PROTECTION (ACD&amp;P)</i>	-	5.473	3.235	5.145	-	5.145	0.000	0.000	2.949	5.604	Continuing	Continuing
IS4: <i>INFORMATION SYSTEMS (ACD&amp;P)</i>	-	7.224	5.928	5.941	-	5.941	0.872	0.297	0.077	0.072	Continuing	Continuing
MB4: <i>MEDICAL BIOLOGICAL DEFENSE (ACD&amp;P)</i>	-	68.160	65.648	83.999	-	83.999	46.501	25.715	34.090	48.338	Continuing	Continuing
MC4: <i>MEDICAL CHEMICAL DEFENSE (ACD&amp;P)</i>	-	1.060	5.681	5.165	-	5.165	0.990	1.975	1.972	7.098	Continuing	Continuing
TE4: <i>TEST &amp; EVALUATION (ACD&amp;P)</i>	-	11.763	14.887	9.157	-	9.157	6.581	5.170	5.165	3.549	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Operational forces have an immediate need to survive, safely operate, and sustain operations in a Chemical and Biological (CB) threat environment across the continuum of global, contingency, special operations/low intensity conflict, counternarcotics, and other high-risk missions. This program element supports the Advanced Component Development and Prototypes (ACD&P) of medical and non-medical CB defensive equipment and materiel. Congress directed centralized management of Department of Defense (DoD) medical and non-medical CB Defense initiatives. DoD missions for civil support operations have recently expanded and have resulted in providing focus to develop technologies to support CB counterterrorism initiatives. ADC&P is conducted for an array of chemical, biological, and toxin detection and warning systems providing early warning, collector concentrators, generic detection, improved reagents, and decontamination systems using solutions that will remove and/or detoxify contaminated materiel without damaging combat equipment, personnel, or the environment. CB sensors and diagnostics enhance the Departments environmental and medical surveillance efforts by improving the monitoring and surveillance of threats and forces preparing for and engaged in military operations. These efforts are required to enable military commanders and the Military Health System to prevent, treat, and mitigate threats to individual Service Members and military units. Integration of CB sensor and diagnostic data from the programs in this ACD&P will also be usable within the homeland security and Federal public health common operating pictures.

The Department of Defense is responsible for research, development, acquisition, and deployment of medical countermeasures to prevent or mitigate the health effects of CB threats to the Armed Forces and directs strategic planning for and oversight of programs to support medical countermeasures development and acquisition for

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>
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our Armed Forces personnel. The CB medical threat to the Armed Forces, in contrast with public health threats to U.S. citizens, encompasses all potential or continuing enemy actions that can render a Service Member combat ineffective. CB medical threats, because they apply as a whole to military units deployed on a specific mission and/or operations, may result in the unit being unable to complete its mission. CB medical countermeasures developed by DoD, unlike those developed to support U.S. population, must support military commanders practical operational requirements and deployment strategies and must emphasize prevention of injury and illness and protection of the force. Preventive measures in this ACD&P, such as vaccines against the most likely biological threat agents and traditional / non-traditional chemical agent prophylaxis, conserves fighting strength, decreases the logistics burden by reducing the need for larger deployed hospital footprint and greater demand for tactical and strategic medical evacuation, and satisfies the need for greater flexibility in military planning and operations. When vaccines and other prophylactic medical countermeasures are not available, efforts on this ACD&P support pre-hospitalization treatment, en-route care, hospital care, and long-term clinical outcomes. Specific items in this category include improvements to CB diagnostics and therapeutics to mitigate the consequences of biologic agents and exposure to ionizing radiation due to nuclear or radiological attacks. DoD is the only Federal activity conducting ACD&P on these prophylactic, diagnostic, and therapeutic CB medical countermeasures.

The Department of Defense coordinates its efforts with the Departments of Health and Human Services to promote synergy and minimize redundancy. The Department of Defense ensures coordination by participating in the Public Health Emergency Medical Countermeasures Enterprise interagency strategic planning process ("One Portfolio"). The Department of Defense's longstanding experience and success in CB medical countermeasure research, development, acquisition, and deployment not only ensures protection of the Armed Forces, it also accelerates and improves the overall national efforts in CB medical countermeasure research, development, and acquisition because of its unique facilities, testing capabilities, and trained and experienced personnel.

ACD&P also supports the development of updated test capabilities to evaluate Chemical, Biological, Radiological, and Nuclear Defense systems.

The projects in this program element support efforts in the technology development phase of the acquisition strategy and are therefore correctly placed in Budget Activity 4.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	170.354	138.187	93.408	-	93.408
Current President's Budget	171.117	138.187	148.518	-	148.518
Total Adjustments	0.763	0.000	55.110	-	55.110
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	0.763	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	55.110	-	55.110

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**Exhibit R-2, RDT&E Budget Item Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

**Appropriation/Budget Activity**  
0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4:  
*Advanced Component Development & Prototypes (ACD&P)*

**R-1 Program Element (Number/Name)**  
PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*

**Change Summary Explanation**

Funding: FY18 - Adjustments due to fact-of-life changes (\$32M) to support advance multiple vaccine candidates for WEVEE, to support advance development of multiple Marburg vaccines to meet TMRR phase exit criteria, and to support Next Generation Anthrax acceleration. Adjustments (\$22M) to support multiple programs successfully continue efforts in advanced development.

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)				<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CA4: CONTAMINATION AVOIDANCE (ACD&P)	-	74.684	42.308	29.211	-	29.211	39.631	26.931	22.935	13.703	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Contamination Avoidance Advanced Component Development and Prototypes (ACD&P) Project supports Component Advanced Development and System Integration (CAD/SI) of reconnaissance, detection, identification, and hazard prediction equipment, hardware, and software. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, Concept of Operations (CONOPS) and Tactics, Techniques, and Procedures (TTPs). Individual efforts are: (1) Enhanced Capability Demonstration (ECD) Integrated Early Warning (IEW), (2) Enhanced Capability Demonstration (ECD) Joint Chemical Biological Radiological Nuclear Advanced Capability Sets (JCACS), (3) Manned Mounted Platform Radiological Detection System, (4) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA), (5) Biosurveillance (BSV), (6) Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets Inc 2 (CBRN DRS Inc 2), (7) Next Generation Chemical Detector (NGCD), (8) Non-Traditional Agent (NTA) Defense.

The Joint Force requires tactical, enhanced, and integrated Chemical Biological Radiological and Nuclear (CBRN) detection, protection, contamination mitigation, contamination characterization, situational awareness, and hazard understanding early warning capability and decision tools to provide operational commanders time and space to mitigate Weapons of Mass Destruction (WMD) effects. The Enhanced Capability Demonstration (ECD) Integrated Early Warning (IEW) will demonstrate these capabilities by enabling Joint operators to locate, track, identify, characterize, sample, digitally report, protect against, and mitigate CBRN threats by merging situational awareness to create understanding. The ECD IEW will integrate advanced technologies to provide capability sets of equipment and situational awareness decision tools to protect against and mitigate the effects of contamination when operating in a CBRN environment.

The Joint Force requires enhanced and integrated Chemical Biological Radiological Nuclear (CBRN) protection, contamination mitigation, contamination characterization, and situational awareness capability sets to mitigate the effects of Weapons of Mass Destruction (WMD). The ECD JCACS will demonstrate these capabilities by enabling Joint operators to locate, identify, characterize, sample, digitally report, protect against, and mitigate CBRN threats. The ECD JCACS will integrate advanced technologies to provide capability sets of equipment and situational awareness tools to protect against and mitigate the effects of contamination during WMD interdiction and site characterization missions.

(MMPRDS) provides ruggedized, networkable detectors with a wide operating range of detection, including prompt neutron/gamma, for integration into vehicles, fixed sites, and ships. It replaces the obsolescent UDR-13 and AN/VDR-2 for mounted operations, providing warning and situational awareness for crews and personnel, and enables mounted RN surveillance and reconnaissance for platforms such as the NBCRV.

The ROSETTA as a FY18 new start is a chemistry based sensor to provide chemical detection and identification capability to the Warfighter. ROSETTA will provide improved surface hazard detection by developing an array of reactive chemistries onto a sampling ticket format to update the currently fielded M256A2. The M256A2 technology data package will be updated with an engineering change proposal to create a new M256A3 kit.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> <i>CA4 / CONTAMINATION AVOIDANCE (ACD&amp;P)</i>

Biosurveillance (BSV) programs provide a set of capabilities that acquire, integrate, and analyze medical, environmental, and incident management data using existing and next generation systems, medical and non-medical sample collection tools and identifiers/diagnostics; and transition hardware/software tools and devices as residuals from the Biosurveillance Joint United States Force Korea (USFK) Portal and Integrated Threat Recognition (JUPITR) Advanced Technology Demonstration (ATD). BSV will align the biosurveillance efforts across DoD and national strategies. BSV will scope and influence BSV capabilities as products to meet Warfighter requirements through innovative management of key BSV initiatives. BSV requirements address medical and physical CBRN mission needs spanned in over eleven requirements documents and through Combatant Commander (COCOM) identified needs. BSV supports Joint US Forces Korea (USFK) Portal and Integrated Threat recognition (JUPITR) ATD, JUONS CC-0557, and Analytical Framework which find, demonstrate, transition, and transfer the best operational concepts and technology solutions in support of a holistic approach to countering CB threats from the laboratory to operational use and theater confirmation of a CB Event. JUPITR ATD consists of four legs; Early Warning (EW), Biological Identification Capabilities Sets (BICS), Assessment of Environmental Detectors (AED), and Biosurveillance Portal (BSP). The JUPITR ATD provides the USFK with a holistic biosurveillance capability to provide early warning, detection, collection, identification, and theater confirmation of a CB event. The JUPITR ATD consists of filling capability gaps through information sharing and communication systems and detection/diagnostic systems for the USFK. Outputs will focus on proving component, CONOPS, and subsystem transition into relevant technologies that are currently programs of record (PORs) to include global-BSP, Next Generation Diagnostic System (NGDS), Joint Biological Tactical Detection System (JBTDS) and CALS. Systems used in Operational Demonstration will be left behind with a two year sustainment plan for continuing use. Whole system live agent test (WSLAT) of AED units will support the Joint Project Manager for Nuclear Biological Chemical Contamination Avoidance business case analysis for maritime and fixed site Point Biological Detection.

The CBRN DRS Inc 2 will provide additional capability, not present in CBRN DRS Inc 1, for detection and identification of CBRN threats, personal protective equipment (PPE), and increased situation awareness through networking and communication of the hazard to support follow on technical forces conducting sensitive site assessment and elimination operations. It will enhance the capability fielded in CBRN DRS Inc 1 to conduct dismounted CBRN reconnaissance, WMD detection or denial, characterization of hazardous material events or accidents, and sensitive site elimination. CBRN Inc 2 will allow follow on technical forces to conduct longer duration missions, field confirmatory CBRN identification, and reach back communications. The CBRN Inc 2 configurations will be tailored to meet individual Service mission tasks.

The NGCD program is several detection systems for vapor and aerosol monitoring (NGCD 1), location of liquid and solids on surfaces (NGCD 2) and sampling of multiplephases of matter (NGCD 3). NGCD will detect and identify non-traditional agents, chemical warfare agents (CWAs), toxic industrial chemicals (TICs) in the air and on surfaces. The NGCD will provide improved NTA/CWA/TIC selectivity and sensitivity on multiple platforms as well as multiple environments. There are four capability areas, of which three; NGCD 1 Detector Alarm, NGCD 2 Survey Detector and NGCD 3 Sample Analysis are in the Technical Maturation and Risk Reduction Phase. The fourth capability, NGCD 4 Individual Detector - personal chemical detection is still in material solution analysis. These sensors will improve detection, consequence management and reconnaissance, and weapons of mass destruction (WMD) interdiction capabilities. The scope of the project includes detection of chemicals a few feet away from the detector as well as the sampling point of the detector.

The NTA Defense program supports chemical and biological (CB) defense acquisition programs throughout entire acquisition process to address emerging threat requirements across the full spectrum of commodities. Dedicated initiatives and projects transition information, technologies, and capabilities into acquisition options/ efforts (Programs of Record, Enhanced Capability Demonstrations, and Accelerated Acquisition) that account for the breadth and depth of emerging threats which span

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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the full range of military missions. The NTA Defense program provides essential enablers such as threat understanding; operational impacts of performance trades; and comprehensive, integrated, and layered defense concepts against emerging threats. The program supports a balanced portfolio which targets capabilities to reduce operational and tactical risk from technology gaps inherent from emerging threats. Additional efforts in conducting systems engineering analysis will occur in order to identify and consolidate capability knowledge gaps and prioritize required investments.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) IEW ECD</p> <p><b>Description:</b> Initiate Early Warning capability integration for remote CBRN and Non-CBRN sensors, robotic platforms, unattended sensors, and decision support.</p> <p><b>FY 2018 Plans:</b> Initiate Early Warning capability integration for remote CBRN and Non-CBRN sensors, robotic platforms, unattended sensors, and decision support.</p>	-	-	3.098
<p><b>Title:</b> 2) IEW ECD</p> <p><b>Description:</b> Initiate Early Warning capability RDT&amp;E test article procurement and assessment for remote CBRN and Non-CBRN sensors, robotic platforms, unattended sensors, and decision support.</p> <p><b>FY 2018 Plans:</b> Initiate Early Warning capability RDT&amp;E test article procurement and assessment for remote CBRN and Non-CBRN sensors, robotic platforms, unattended sensors, and decision support.</p>	-	-	2.500
<p><b>Title:</b> 3) JCACS ECD</p> <p><b>Description:</b> Purchase test articles, initiate tests and test preparation on the equipment list, support residual materiel.</p> <p><b>FY 2018 Plans:</b> Purchase test articles, initiate tests and test preparation on the equipment list, support residual materiel.</p>	-	-	9.433
<p><b>Title:</b> 4) MMRPDS - Program Management</p> <p><b>Description:</b> Provide Program Management Support</p> <p><b>FY 2018 Plans:</b> Initiate Government program management and Integrated Product Team (IPT) support.</p>	-	-	0.177
<p><b>Title:</b> 5) MMRPDS - System Engineering</p> <p><b>Description:</b> Provide system engineering support to the MMPDRS program.</p>	-	-	0.219

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<b>FY 2018 Plans:</b> Provide system engineering support for the program.			
<b>Title:</b> 6) ROSETTA <b>Description:</b> Provide system engineering design.		-	-
<b>FY 2018 Plans:</b> Initiate development of colorimetric sensor.			0.350
<b>Title:</b> 7) ROSETTA <b>Description:</b> Management Services		-	-
<b>FY 2018 Plans:</b> Initiate Government strategic planning, systems engineering, and program management.			0.145
<b>Title:</b> 8) BSV <b>Description:</b> Biosurveillance Analytical Framework (AF)		1.331	-
<b>FY 2016 Accomplishments:</b> Established a System Integration Lab (SIL) with an operational Closed Restricted Network (CRN).			-
<b>Title:</b> 9) BSV <b>Description:</b> Combined Joint Task Force-Operation Inherent Resolve (CJTF-OIR) Joint Urgent Operational Need (JUON) CC-0557		2.300	-
<b>FY 2016 Accomplishments:</b> Investigated and tested potential material solutions to address specific CB threats, work focused on the immediate Chemical threats within certain Forward Operating Bases (FOBs).			-
<b>Title:</b> 10) BSV <b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - Biological Identification Capability Sets (BICS).		3.579	0.421
<b>FY 2016 Accomplishments:</b>			-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued to provide residual capability for the Biological Identification Capability Sets (BICS) under the BSV USFK JUPITR ATD. <b>FY 2017 Plans:</b> Continue to support residual capability for the BICS under the BSV USFK JUPITR ATD.			
<b>Title:</b> 11) BSV <b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - Assessment of Environmental Detectors (AED). <b>FY 2016 Accomplishments:</b> Continued to provide residual capability for JUPITR Technologies specifically the Assessment of Environmental Detectors (AED). <b>FY 2017 Plans:</b> Continue to support residual capabilities at Busan for JUPITR Technologies specifically the AED.	1.514	0.740	-
<b>Title:</b> 12) BSV <b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - Early Warning (EW). <b>FY 2016 Accomplishments:</b> Continued to provide residual capability and conduct an integration assessment for the Early Warning (EW) component under the BSV USFK JUPITR ATD. <b>FY 2017 Plans:</b> Continue to support residual capability for the EW components under the BSV USFK JUPITR ATD.	13.549	0.400	-
<b>Title:</b> 13) BSV <b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - Biosurveillance Portal (BSP). <b>FY 2016 Accomplishments:</b> Continued to provide residual capability for the Biosurveillance Portal (BSP) under the BSV USFK JUPITR ATD. <b>FY 2017 Plans:</b> Continue to support residual capability for the BSP under the BSV USFK JUPITR ATD.	2.911	0.306	-
<b>Title:</b> 14) BSV	1.050	1.839	8.768



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017	
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - residual capability and operational demonstration test support.</p> <p><b>FY 2016 Accomplishments:</b> Continued to provide residual capability and operational demonstration test support for AED, EW, BSP and BICS within the USFK JUPITR ATD.</p> <p><b>FY 2017 Plans:</b> Continue to provide residual capability (through contractor logistics support) and operational demonstration test support for AED, EW, BSP and BICS for Busan Pier 8 JUPITR ATD. Initiate Camp Humphreys JUPITR system deployment.</p> <p><b>FY 2018 Plans:</b> Continue to provide residual capability (through contractor logistics support) and operational demonstration test support for AED, EW, BSP and BICS for Busan Pier 8 JUPITR ATD. Complete Camp Humphreys JUPITR system deployment.</p>			
<p><b>Title:</b> 15) BSV</p> <p><b>Description:</b> Biosurveillance Joint United Forces Korea Portal and Integrated Threat Reduction (JUPITR) Advanced Technology Demonstration (ATD) - ATD efforts.</p> <p><b>FY 2016 Accomplishments:</b> Continued to support the ATD efforts and overall transition of technologies to programs of record. Supported program management and systems engineering to ensure integration across residual capabilities for AED, EW, BSP and BICS within the USFK JUPITR ATD.</p> <p><b>FY 2017 Plans:</b> Continue to support the ATD efforts and overall transition of technologies to programs of record. Supports program management and systems engineering to ensure integration across residual capabilities for AED, EW, BSP and BICS within the USFK JUPITR ATD.</p>		4.915	0.247
<p><b>Title:</b> 16) CBRN DRS Inc 2</p> <p><b>Description:</b> CBRN DRS Inc 2 - Design testing and review.</p> <p><b>FY 2018 Plans:</b> Initiate Engineering Design Testing (EDT), and complete Preliminary Design Review (PDR).</p>		-	-
<p><b>Title:</b> 17) NGCD</p>		4.146	8.541
			0.985

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Test Events</p> <p><b>FY 2016 Accomplishments:</b> Completed Brassboard testing. Initiated Final prototype testing and Early Operational Assessment (EOA).</p> <p><b>FY 2017 Plans:</b> Complete Final Prototype testing. Initiate manufacturing and affordability assessment.</p>				
<p><b>Title:</b> 18) NGCD</p> <p><b>Description:</b> NGCD 1 - Smiths Detection Contract</p> <p><b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles (five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>		0.847	0.619	-
<p><b>Title:</b> 19) NGCD</p> <p><b>Description:</b> NGCD 1 - Signature Science Contract</p> <p><b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles (five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>		4.058	1.854	-
<p><b>Title:</b> 20) NGCD</p> <p><b>Description:</b> NGCD 1 - Chemring Chemhound Contract</p> <p><b>FY 2016 Accomplishments:</b></p>		2.710	1.169	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&E test articles (five systems). <b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.				
<b>Title:</b> 21) NGCD <b>Description:</b> NGCD 2 - Chemring Trace Contamination Surface Detector Contract <b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&E test articles (five systems). <b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.		1.650	1.525	-
<b>Title:</b> 22) NGCD <b>Description:</b> NGCD 2 - FLIR/NOMADICS Contract <b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&E test articles(five systems). <b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.		2.948	2.153	-
<b>Title:</b> 23) NGCD <b>Description:</b> NGCD 2 - ChemImage Contract <b>FY 2016 Accomplishments:</b>		4.336	1.926	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles (five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>				
<p><b>Title:</b> 24) NGCD <b>Description:</b> NGCD 3 - Bruker Contract</p> <p><b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles (five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>		1.411	0.992	-
<p><b>Title:</b> 25) NGCD <b>Description:</b> NGCD 3 - Chemring MARS Contract</p> <p><b>FY 2016 Accomplishments:</b> Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles (five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>		2.728	1.576	-
<p><b>Title:</b> 26) NGCD <b>Description:</b> NGCD 3 - Battelle Contract</p> <p><b>FY 2016 Accomplishments:</b></p>		2.797	2.085	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Completed maturation of Brassboard system. Continued performing system engineering, technical management, technology experimentation, system design, and support Government testing. Awarded option to develop Final prototype RDT&amp;E test articles(five systems).</p> <p><b>FY 2017 Plans:</b> Continue performing system engineering, technical management, technology experimentation, system design, and support Government testing.</p>				
<p><b>Title:</b> 27) NGCD</p> <p><b>Description:</b> Management Services for Four Capabilities</p> <p><b>FY 2016 Accomplishments:</b> Continued Government Integrated Product Development Team, program management, systems engineering and IPT support (NGCD 1-3).</p> <p><b>FY 2017 Plans:</b> Continue Government Integrated Product Development Team, program management, systems engineering and IPT support.</p> <p><b>FY 2018 Plans:</b> Continue Government and contracted Integrated Product Development Team, program management, systems engineering and IPT support (NGCD 4 only; transition NGCD 1-3 to BA5). FY 18-22 POM was first year to break out capabilities</p>		15.238	10.234	1.037
<p><b>Title:</b> 28) NGCD</p> <p><b>FY 2017 Plans:</b> Continue to evaluate transitional technology from S&amp;T.</p>		-	3.000	-
<p><b>Title:</b> 29) NTA Defense</p> <p><b>Description:</b> Technology Assessments</p> <p><b>FY 2016 Accomplishments:</b> Initiated testing/characterization of Commercial Off The Shelf (COTS) CB systems to determine potential technology candidates for inclusion into program acquisition strategies to support emerging threat priorities.</p> <p><b>FY 2017 Plans:</b> Continue testing / characterization of emerging Commercial Off The Shelf (COTS) technologies to determine potential candidates for inclusion into advanced and emerging threat test and experimentation activities.</p> <p><b>FY 2018 Plans:</b></p>		0.666	0.884	1.657

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue testing/characterization of emerging Commercial Off The Shelf (COTS) technologies to determine potential candidates for inclusion into advanced and emerging threat test and experimentation activities. Continue characterization testing to meet current and anticipated capability needs of JPEO programs of record. Leveraging of previous investment in Design of Experiment and detection algorithms to support program testing and risk reduction.			
<p><b>Title:</b> 30) NTA Defense</p> <p><b>Description:</b> Threat Understanding/ATD Front End Analysis</p> <p><b>FY 2017 Plans:</b> Conduct analysis of threat understanding for additional threat classes to enable refinement of technology and capability gaps identified during mission analysis. Conduct planning for expanded threat characterization and initiate execution. Conduct front end analysis to support future Multi Threat Multi Commodity ATDs and experimentation.</p>	-	0.920	-
<p><b>Title:</b> 31) NTA Defense</p> <p><b>Description:</b> Systems Engineering</p> <p><b>FY 2017 Plans:</b> Conduct mission modeling and incorporate emerging technology to refine advanced threat investment strategies.</p> <p><b>FY 2018 Plans:</b> Conduct mission modeling and incorporate emerging technology to refine advanced threat investment strategies.</p>	-	0.537	0.472
<p><b>Title:</b> 32) NTA Defense</p> <p><b>Description:</b> Strategic Coordination</p> <p><b>FY 2017 Plans:</b> Conduct NTA Library transition readiness to the CB Effects Manual. Update and maintain NTA Library. Conduct development of the Integrated Acquisition Portal for analysis to support refinement of investment strategies.</p> <p><b>FY 2018 Plans:</b> Initiate transition to CB-1 Effects Manual Update and maintain NTA Library.</p>	-	0.340	0.370
<b>Accomplishments/Planned Programs Subtotals</b>	74.684	42.308	29.211

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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**C. Other Program Funding Summary (\$ in Millions)**

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• CA5: CONTAMINATION AVOIDANCE (EMD)	55.468	50.203	127.499	-	127.499	150.657	96.220	52.480	35.941	Continuing	Continuing
• JF0100: JOINT CHEMICAL AGENT DETECTOR (JCAD)	27.134	7.547	4.253	-	4.253	3.500	0.000	0.000	0.000	0	42.434
• JF0104: NEXT GEN CHEMICAL DETECTOR (NGCD)	0.000	2.378	0.000	-	0.000	1.722	15.872	61.516	86.432	Continuing	Continuing
• MC0100: JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)	12.900	1.956	0.500	-	0.500	0.000	0.000	0.000	7.655	Continuing	Continuing
• MC0101: CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)	111.248	90.094	94.424	-	94.424	93.269	59.358	45.924	55.062	Continuing	Continuing
• MX0001: JOINT BIO TACTICAL DETECTION SYSTEM (JBTDs)	0.000	0.000	0.000	-	0.000	0.000	46.724	68.825	75.502	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

ENHANCED CAPABILITY DEMO INTEGRATED EARLY WARNING (ECD IEW)

The Enhanced Capability Demonstration Integrated Early Warning (ECD IEW) will conduct an analysis of alternatives and leverage the DTRA IEW ATD to procure developmental equipment for experimentation and demonstration to reduce risk and inform supporting materiel solutions, CONOPS TTPs, Non-CBRN sensors, and requirements to provide operational commanders time and space for freedom to maneuver and action. The ECD IEW will utilize Table Top Exercises (TTX), Operational Demonstrations, and other test events to provide cross commodity equipment sets evaluation leading to the operational deployment to a unit to be determined, with two years of sustainment, further requirements development, CBDP program of record insertion, and concepts of employment.

ENHANCED CAPABILITY DEMONSTRATION JOINT CBRNE ADV CAPABILITY SETS (ECD JCACS)

The Enhanced Capability Demonstration (ECD) Joint Chemical Biological Radiological Nuclear Advanced Capability Sets (JCACS) is an ECD that requires various sets of equipment to be evaluated during Army Warfighting Assessments (AWA) and other test events. The acquisition strategy uses existing task-order contracts (including support contracts) and existing supply contracts from Programs of Record to acquire the equipment and technical support required for the effort. Additionally, other Government Agencies and Federally Funded Research and Development Centers will be used to provide development, testing and technical support.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> CA4 / <i>CONTAMINATION AVOIDANCE (ACD&amp;P)</i>
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**MOUNTED MANNED PLATFORM RADIOLOGICAL DETECTION SYSTEM (MMPRDS)**

The Mounted Manned Platform Radiological Detection System (MMPRDS) leverages technology transition with the Defense Threat Reduction Agency (DTRA) J9 NT to expedite technology maturation. DTRA-developed systems will provide component-level test data in support of Milestone B, after which Engineering Manufacturing Development (EMD) contracts will be awarded for exterior-mounted and interior-mounted vehicle sensors. Milestone C will be supported at least in part by joint evaluation with the NBCRV Sensor Suite Upgrade program. Based on market research, available COTS solutions for interior-mounted vehicle sensors may result in further acquisition streamlining for a portion of the solution set.

**REACTIVE CHEMISTRY ORTHOGONAL SURFACE AND ENVIRONMENTAL THREAT TICKET ARRAY (ROSETTA)**

The Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA) will use a streamlined acquisition strategy. This approach is based on the technology that will transition from the Science and Technology efforts. An Engineering Change Proposal (ECP) will be prepared to augment the M256A2 Kits. Full and Open Competition will be utilized.

**BIOSURVEILLANCE (BSV)**

BSV is a set of capabilities that acquire, integrate, and analyze medical, environmental, and incident management data using existing and next generation systems, medical and non-medical sample collection tools and identifiers/diagnostics. These capabilities will transition as residuals from the Biosurveillance Joint United States Force Korea (USFK) Portal and Integrated Threat Recognition (JUPITR) Advanced Technology Demonstration (ATD). The JUPITR system of systems will be released to Busan Pier 8 and Camp Humphreys with a two year paid sustainment. Lessons learned, technologies, concepts of employment from the ATD will be transitioned to the programs of record associated with the CBDP (such as G-BSP, EMBD, NGDS, JBTDS & CALS).

**CBRN DISMOUNTED RECONNAISSANCE SYSTEMS**

BA4: The Chemical Biological Radiological Dismounted Reconnaissance Systems (CBRN DRS) Inc 2 program will provide an Advanced Capabilities Set (ACS) for use by Joint Technical Forces in Sensitive Site Assessment in conjunction with their existing baseline CBRN DRS Inc 1 system. The ACS will be comprised of Government (GOTS) and commercial off-the-shelf (COTS) equipment to the greatest extent possible. The ACS will be used by Joint Technical Forces in conjunction to their CBRN DRS Inc 1 system to support Sensitive Site Exploitation. Requirements analysis will support Materiel Development Decision and study guidance for the Analysis of Alternatives (AoA). The AoA will identify potential solutions and support further requirements development, culminating in an approved Capabilities Development Document. Contracting efforts will be initiated under the Joint Enterprise Research, Development, Acquisition and Production Contracts. Contracting will cover a base period of performance for development/integration with options for Low-Rate and Full Rate Production (FRP).

BA7: The Chemical Biological Radiological Dismounted Reconnaissance Systems (CBRN DRS) program uses a government-off-the-shelf (GOTS)/commercial-off-the-shelf (COTS) non-developmental item (NDI) single step acquisition approach to a full capability. This strategy employs an NDI acquisition concept to establish a



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Exhibit R-2A, RDT&E Project Justification: FY 2018 Chemical and Biological Defense Program Date: May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
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simplified management framework to translate mission needs and emerging technology capabilities into a stable, affordable, well-managed acquisition program. CBRN DRS systems will be produced using a workshare approach between Organic assets and Contractor production facilities.

**NEXT GENERATION CHEMICAL DETECTOR (NGCD)**

System Engineering and market survey results suggested the most effective way to develop NGCD was to divide the program into four unique capabilities to detect and identify the full spectrum of chemical compounds in all phases of matter. There are four capability areas, of which three; NGCD 1, NGCD 2 and NGCD 3 were awarded contracts in the Technical Maturation and Risk Reduction Phase. The fourth capability - personal chemical detection is still in technology development. The Government awarded ten (10) contracts in June 2014 to support Technology Maturation Risk Reduction (TMRR) acquisition phase activities in three of the four capability areas: three (3) contracts for the NGCD 1 capability, four (4) contracts for the NGCD 2 capability, and three (3) contracts for the NGCD 3 capability; only 9 are still under contract. Full and Open competition will be used to award at MS B Engineering and Manufacturing Development (EMD) contracts with production options for each capability.

**NON TRADITIONAL AGENT DEFENSE (NTA DEFENSE)**

The Non-Traditional Agent (NTA) Defense program supports the Chemical Biological Defense Program (CBDP) to develop countermeasures for all emerging threats across all commodities. The NTA Defense program consists of a number of projects and initiatives through various types of contract actions (full and open competition, task order/modifications, DLA) that enhance the CBDP's portfolio and mission and feed directly into Programs of Record, Enhanced Capability Demonstrations, and Acquisition Programs. NTA Defense efforts: (1) evaluate COTS and GOTS technologies and systems, (2) conduct demonstrations and experiments, (3) integrate Intelligence Community threat analysis, operational risk analysis with systems technical performance to identify technologies or systems that can be rapidly developed, and deployed, and/or transitioned to an Acquisition Program for technology insertion or derive an Engineering Change Proposal (ECP) to a fielded system, and (4) provide coordination of DoD, interagency, international NTA projects.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ECD JCACS - HW - Product Development	MIPR	Various : Various	0.000	0.000		0.000		4.770	Mar 2018	-		4.770	Continuing	Continuing	0.000
ROSETTA - HW S - ROSETTA	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.350	Feb 2018	-		0.350	Continuing	Continuing	0.000
BSV - HW S - JUONS CC-0557 M908 Testing	C/CPFF	Battelle Memorial Institute : Aberdeen, MD	0.000	0.155	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - HW S - JUONS CC-0557 AP4C Purchase for Testing	MIPR	Proengin : Plantation, FL	0.000	0.048	Jul 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - HW S - Analytical Framework SW/HW	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.417	May 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #1 (NGCD 1)	C/CPIF	Smiths Detection : Edgewood, MD	1.478	0.847	Dec 2015	0.619	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #2 (NGCD 1)	C/CPIF	Signature Science : Austin, TX	6.435	4.058	Dec 2015	1.854	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #3 (NGCD 1)	C/CPIF	Chemring Chemhound : Charlotte, NC	3.224	2.710	Dec 2015	1.169	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #1 (NGCD 2)	C/CPIF	Chemring TCSD : Charlotte, NC	3.957	1.650	Jan 2016	1.525	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #2 (NGCD 2)	C/CPIF	FLIR/Nomadics : Stillwater, OK	5.981	2.948	Jan 2016	2.153	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #3 (NGCD 2)	C/CPIF	ChemImage : Pittsburgh, PA	4.334	4.116	Jan 2016	1.926	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGCD - HW S - Prototype System Design #1 (NGCD 3)	C/CPIF	Bruker Detection Corp. : Billerica, MA	3.451	1.911	Jan 2016	0.992	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #2 (NGCD 3)	C/CPIF	Chemring MARS : Charlotte, NC	4.200	3.278	Jan 2016	1.576	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype System Design #3 (NGCD 3)	C/CPIF	Battelle Memorial Institute : Columbus, OH	4.951	2.297	Jan 2016	2.085	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - NTA Defense	C/CPFF	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.000	0.150	May 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - COTS Characterization	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.465	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Technology Assessments	MIPR	Various : Various	0.000	0.000		0.545	Mar 2017	1.246	Mar 2018	-		1.246	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Strategic Coordination	MIPR	Various : Various	0.000	0.000		0.210	Mar 2017	0.257	Mar 2018	-		0.257	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Systems Engineering	MIPR	Various : Various	0.000	0.000		0.330	Mar 2017	0.330	Mar 2018	-		0.330	Continuing	Continuing	0.000
NTA DEFENSE - NHW S - Threat Understanding	MIPR	Various : Various	0.000	0.000		0.380	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			38.011	25.050		15.364		6.953		-		6.953	-	-	0.000

<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ECD IEW - Mission Analysis	FFRDC	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.000	0.000		0.000		1.000	Oct 2017	-		1.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ECD IEW - Acquisition, Integration and decision tool demonstration	C/CPFF	TBD : TBD	0.000	0.000		0.000		1.500	Oct 2017	-		1.500	Continuing	Continuing	0.000
ECD IEW - System Integration	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.500	Oct 2017	-		0.500	Continuing	Continuing	0.000
MMPRDS - ES C - Engineering Support	MIPR	JPM Guardian : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.219	Oct 2017	-		0.219	Continuing	Continuing	0.000
BSV - ES S - JUONS CC-0557 Test Planning and Execution	MIPR	Various : Various	0.000	0.059	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - JUONS CC-0557 Test Range Access for S/K III Challenge	MIPR	West Desert Test Center : Dugway, UT	0.000	1.341	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - Analytical Framework	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.080	May 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - TD/D C - BSP residual purchase and sustainment	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	3.798	Jan 2016	0.528	Jan 2017	0.538	Jan 2018	-		0.538	Continuing	Continuing	0.000
BSV - ES S - Early Warning sustainment costs for software package	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	7.769	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - Early Warning sustainment costs for software package #2	MIPR	Science Applications International Corporation (SAIC) : Abingdon, MD	0.000	4.300	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BSV - ES S - Assessment of Environmental Detectors (6 systems at OSAN)	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	2.402	Jan 2016	0.962	Jan 2017	1.745	Jan 2018	-		1.745	Continuing	Continuing	0.000
BSV - TD/D C - Biological Identification Capability Sets sustainment assays	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	4.467	Oct 2015	0.642	Nov 2016	0.856	Jan 2018	-		0.856	Continuing	Continuing	0.000
BSV - ES S - Early Warning sustainment costs for software package #3	MIPR	Various : Various	0.000	2.368	Oct 2015	0.626	Jan 2017	4.534	Jan 2018	-		4.534	Continuing	Continuing	0.000
NGCD - ES S - Joint Service T&E/SE IPT	MIPR	Various : Various	2.460	1.591	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - ES S - Integrated Product Team	MIPR	Various : Various	0.000	0.000		0.170	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			2.460	28.175		2.928		10.892		-		10.892	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ECD IEW - IEW TTX & OP DEMOs	MIPR	Various : Various	0.000	0.000		0.000		1.000	Oct 2017	-		1.000	Continuing	Continuing	0.000
ECD JCACS - DTE - Test and Evaluation	MIPR	Various : Various	0.000	0.000		0.000		3.100	Apr 2018	-		3.100	Continuing	Continuing	0.000
BSV - DTE S - JUONS CC-0557 Test Development and Evaluation	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.381	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - OTE S - Operational Assessment	MIPR	Army Test and Evaluation Command (ATEC) :	0.000	0.000		0.100	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Aberdeen Proving Ground, MD													
BSV - DTE S - Cyber Testing, Developmental Testing, Busan Event	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	1.269	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBRN DRS - DTE - CBRN DRS Inc 2 Test and Evaluation	MIPR	Various : Various	0.000	0.000		0.000		0.835	Nov 2017	-		0.835	Continuing	Continuing	0.000
NGCD - 3M Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	3.125	0.500	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - Blind Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.780	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - Early Operational Assessment (EOA)	MIPR	Operational Test Command (OTC) : Ft. Hood, TX	0.000	0.666	Sep 2016	1.200	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - OTHT C - DT/OT Chemical Chamber	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		3.898	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - OTHT SB - MIL-STD 810G	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.800	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - OTHT SB - False Alarm Testing	MIPR	Operational Test Command (OTC) : Ft. Hood, TX	0.000	0.000		0.600	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - OTHT SB - CARD/SPIRES Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		1.143	Feb 2017	0.000		-		0.000	Continuing	Continuing	0.000
NGCD - OTHT SB - Chemical Purchase	MIPR	Edgewood Chemical Biological Center	0.000	0.500	Mar 2016	0.900	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		(ECBC) : Aberdeen Proving Ground, MD													
NGCD - OTHB SB - Final Prototype Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.700	Oct 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Threat Understanding	MIPR	Various : Various	0.000	0.000		0.200	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - NTA Defense-Field Experimentation	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.051	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			3.125	5.847		8.841		4.935		-		4.935	-	-	0.000

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ECD IEW - IEW - PM/MS S - Labor and Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.750	Oct 2017	-		0.750	Continuing	Continuing	0.000
ECD IEW - IEW - PM/MS S - ECBC Matrix Govt labor	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.500	Oct 2017	-		0.500	Continuing	Continuing	0.000
ECD IEW - IEW - PM/MS S - ECBC ECD Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.348	Oct 2017	-		0.348	Continuing	Continuing	0.000
ECD JCACS - PM-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO,	0.000	0.000		0.000		1.563	Dec 2017	-		1.563	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Aberdeen Proving Ground, MD													
MMPRDS - PM/MS C - Program Management	MIPR	JPM Guardian : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.177	Oct 2017	-		0.177	Continuing	Continuing	0.000
ROSETTA - PM/MS C - ROSETTA	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.145	Nov 2017	-		0.145	Continuing	Continuing	0.000
BSV - PM/MS S - JUONS CC-0557 Test Analysis Support	MIPR	Various : Various	0.000	0.316	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - PM/MS S - Analytical Framework	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.834	May 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - PM/MS S - BMO Labor & Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.504	Aug 2016	0.454	Nov 2016	0.454	Jan 2018	-		0.454	Continuing	Continuing	0.000
BSV - PM/MS S - ECBC ATD Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.641	Mar 2016	0.641	Jan 2017	0.641	Jan 2018	-		0.641	Continuing	Continuing	0.000
CBRN DRS - PM - CBRN DRS Inc 2-PM/MS-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.150	Dec 2017	-		0.150	Continuing	Continuing	0.000
NGCD - PM/MS S - Program Management	MIPR	JPM NBC Contamination Avoidance (JPM	11.865	13.317	Nov 2015	13.234	Nov 2016	1.037	Nov 2017	-		1.037	Continuing	Continuing	0.000



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
and Systems Engineering Support		NBC CA) : JPEO, Aberdeen Proving Ground, MD														
NTA DEFENSE - PM/MS S - Program Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.846	Mar 2017	0.666	Dec 2017	-		0.666	Continuing	Continuing	0.000	
<b>Subtotal</b>			11.865	15.612		15.175		6.431		-		6.431	-	-	0.000	
<b>Project Cost Totals</b>			55.461	74.684		42.308		29.211		-		29.211	-	-	-	

Remarks

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> FY 2018 Chemical and Biological Defense Program			<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> CA4 / <i>CONTAMINATION AVOIDANCE (ACD&amp;P)</i>	

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ECD IEW - IEW ECD Exercises									████████████████████																			
ECD JCACS - User Feedback Event (UFE)									████████																			
ECD JCACS - UFE													████████															
ECD JCACS - Network Integration Evaluation (NIE) 19.2													████████															
ECD JCACS - OPDEMO													████████████████															
ECD JCACS - Residual Support																	████████████████████											
MMPRDS - Milestone B													████															
MMPRDS - Request for Proposal																	████											
MMPRDS - Milestone C																					████████							
ROSETTA - Engineering Design									████████████																			
ROSETTA - Management Services									████████████																			
BSV - JUPITR ATD	██████████																											
BSV - JUPITR ATD Purchase and Support Residuals	████████████████████																											
BSV - Biological Identification Capability Sets (BICS) Exercises	████																											
BSV - Residual Purchase - Additional Systems (Camp Humphreys)	████████████████████																											
BSV - Transition of residual end items (Busan)					████████████████████																							
CBRN DRS Increment 2 - Materiel Development Decision									████																			
CBRN DRS Increment 2 - Engineering Design Test									██████████																			
CBRN DRS Increment 2 - Preliminary Design Review													████															

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CBRN DRS Increment 2 - Milestone B																												
CBRN DRS Increment 2 - Critical Design Review																												
CBRN DRS Increment 2 - Preliminary Qualification Test																												
CBRN DRS Increment 2 - Milestone C																												
CBRN DRS Increment 2 - LRIP																												
CBRN DRS Increment 2 - FRP																												
CBRN DRS Increment 2 - MOT																												
CBRN DRS Increment 2 - OER																												
NGCD - NGCD (1-3) TMRR																												
NGCD - NGCD 1 - Milestone B																												
NGCD - NGCD 1 - EMD Contract																												
NGCD - NGCD 1 - Milestone C																												
NGCD - NGCD 1 - LRIP																												
NGCD - NGCD 1 - FRP Decision																												
NGCD - NGCD 2 - Milestone B																												
NGCD - NGCD 2 - EMD Contract																												
NGCD - NGCD 2 - Milestone C																												
NGCD - NGCD 2 - LRIP																												
NGCD - NGCD 3 - Milestone B																												
NGCD - NGCD 3 - EMD Contract																												
NGCD - NGCD 3 - Milestone C																												
NGCD - NGCD 3 - LRIP																												
NGCD - NGCD 3 - FRP																												
NGCD - NGCD 4 - TMRR																												

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

NTA DEFENSE - Technology Assessments: COTS Characterization																												
NTA DEFENSE - Strategic Coordination																												
NTA DEFENSE - Threat Understanding/ATD Front End Analysis																												
NTA DEFENSE - System Engineering/Mission Modeling																												

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ECD IEW - IEW ECD Exercises	1	2018	4	2022
ECD JCACS - User Feedback Event (UFE)	1	2018	2	2018
ECD JCACS - UFE	4	2018	1	2019
ECD JCACS - Network Integration Evaluation (NIE) 19.2	2	2019	3	2019
ECD JCACS - OPDEMO	4	2019	2	2020
ECD JCACS - Residual Support	2	2020	1	2022
MMPRDS - Milestone B	3	2019	3	2019
MMPRDS - Request for Proposal	1	2020	1	2020
MMPRDS - Milestone C	4	2021	1	2022
ROSETTA - Engineering Design	2	2018	1	2019
ROSETTA - Management Services	2	2018	1	2019
BSV - JUPITR ATD	1	2016	3	2016
BSV - JUPITR ATD Purchase and Support Residuals	1	2016	4	2018
BSV - Biological Identification Capability Sets (BICS) Exercises	1	2016	1	2016
BSV - Residual Purchase - Additional Systems (Camp Humphreys)	2	2016	2	2018
BSV - Transition of residual end items (Busan)	1	2017	4	2018
CBRN DRS Increment 2 - Materiel Development Decision	4	2017	4	2017
CBRN DRS Increment 2 - Engineering Design Test	1	2018	3	2018
CBRN DRS Increment 2 - Preliminary Design Review	1	2019	1	2019
CBRN DRS Increment 2 - Milestone B	3	2019	3	2019
CBRN DRS Increment 2 - Critical Design Review	2	2020	2	2020
CBRN DRS Increment 2 - Preliminary Qualification Test	2	2020	2	2020

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> CA4 / CONTAMINATION AVOIDANCE (ACD&P)
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Events	Start		End	
	Quarter	Year	Quarter	Year
CBRN DRS Increment 2 - Milestone C	2	2021	2	2021
CBRN DRS Increment 2 - LRIP	2	2021	2	2021
CBRN DRS Increment 2 - FRP	2	2022	2	2022
CBRN DRS Increment 2 - MOT	2	2022	2	2022
CBRN DRS Increment 2 - OER	3	2022	3	2022
NGCD - NGCD (1-3) TMRR	1	2016	3	2017
NGCD - NGCD 1 - Milestone B	4	2017	4	2017
NGCD - NGCD 1 - EMD Contract	1	2019	2	2020
NGCD - NGCD 1 - Milestone C	2	2020	2	2020
NGCD - NGCD 1 - LRIP	2	2020	4	2021
NGCD - NGCD 1 - FRP Decision	4	2021	4	2021
NGCD - NGCD 2 - Milestone B	3	2018	3	2018
NGCD - NGCD 2 - EMD Contract	3	2018	4	2020
NGCD - NGCD 2 - Milestone C	1	2021	1	2021
NGCD - NGCD 2 - LRIP	2	2021	4	2022
NGCD - NGCD 3 - Milestone B	2	2018	2	2018
NGCD - NGCD 3 - EMD Contract	2	2018	3	2020
NGCD - NGCD 3 - Milestone C	3	2020	3	2020
NGCD - NGCD 3 - LRIP	3	2020	3	2022
NGCD - NGCD 3 - FRP	3	2022	3	2022
NGCD - NGCD 4 - TMRR	1	2020	4	2021
NTA DEFENSE - Technology Assessments: COTS Characterization	1	2016	4	2022
NTA DEFENSE - Strategic Coordination	1	2017	4	2022
NTA DEFENSE - Threat Understanding/ATD Front End Analysis	1	2017	4	2022
NTA DEFENSE - System Engineering/Mission Modeling	1	2017	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)				<b>Project (Number/Name)</b> DE4 / DECONTAMINATION SYSTEMS (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DE4: DECONTAMINATION SYSTEMS (ACD&P)	-	2.753	0.500	9.900	-	9.900	9.156	15.301	16.269	17.768	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project supports the development of Contamination Mitigation (ConMit) systems utilizing solutions that will remove and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment. ConMit systems provide a force restoration capability for units that become contaminated. Development efforts will provide systems that reduce operational impact and logistics burden, reduce sustainment costs, increase safety, and minimize environmental effects associated with decontamination and contamination mitigation operations. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and Tactics, Techniques, and Procedures (TTPs).

The programs supported under this Project include (1) Contaminated Human Remains System (CHRS), (2) Tactical Disablement System (TACDS), and (3) Joint Biological Agent Decontamination System (JBADS).

The CHRS is a follow-on to the Contaminated Human Remains Pouch (CHRP). The CHRS will address two capabilities identified within the Contamination Mitigation (ConMit) Initial Capabilities Document: a Contaminated Human Remains Transfer Case (CHRT) packaging solution to safely repatriate chemical, biological, or radiological contaminated human remains to the Continental United States and a sustainable Contaminated Human Remains Decontamination System (CHRDS) to reduce the hazard to warfighters by decontaminating chemical, biological, or radiological contaminated human remains.

The CHRT is a containment system which will protect personnel from the hazards associated with transporting human remains that are potentially contaminated with chemical, biological or radiological agents and Toxic Industrial Materials (TIM) without posing additional risk to the handlers or the environment in accordance with federal and international transportation standards.

The CHRDS is a system of tents, plumbing, generators, and medical equipment necessary to establish a decontamination site to perform decontamination, identification, and packaging of contaminated human remains for further disposition. The CHRDS will reduce the hazards associated with contaminated human remains through decontamination of remains and enable positive identification of remains for the Armed Forces Medical Examiner before packaging in a CHRT.

The TACDS, a new start, shall be designed to meet the warfighters chemical materials of concern (CMOC) destruction needs. This system will provide a new deployable tactical disablement capability for small quantities of chemical and biological warfare materiel in bulk agent containers and munitions, used in an operational environment. DoD's Countering Weapons of Mass Destruction (CWMD) Strategy enables early action through pathway defeat, shaping the environment to dissuade actors from pursuing WMD. The strategy also asserts the Department must respond effectively to WMD crises when called upon. The TACDS program will ultimately develop, integrate, test and produce a family of systems (FoS) which enable the Warfighter to Identify, Defeat, Disable, and Dispose of small quantities of Chemical

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> DE4 / DECONTAMINATION SYSTEMS (ACD&P)
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Warfare Materials (CWM) or Biological Warfare Materials (BWM) in both bulk container(s) and assembled munitions. TACDS will consist of two capabilities; (1) Rapid Defeat System - Munitions, and (2) Rapid Defeat System - Agent.

The JBADS will provide the capability to conduct biological and chemical agent decontamination of the interior and exterior of aircraft and vehicle platforms. The capabilities will be provided in two increments. Increment I will provide thorough biological decontamination of the interior and exterior of cargo aircraft. The JBADS Increment I is a capability set that will include a shelter to encapsulate an airframe, a decontamination delivery system (e.g. hot-humid air-blower, etc.), environmental control and monitoring system(s), and other ancillary components required to ensure efficacious biological agent decontamination. It will provide the capability to decontaminate biologically contaminated airframes to safe levels and allow more rapid return to service. Increment II will expand upon the Increment I capability set. Increment II will develop multiple decontaminants and modular designs to address various platforms and chemical agent decontamination.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) CHRS - CHRT</p> <p><b>FY 2017 Plans:</b> Prepare documentation for and conduct Milestone A review for the Contaminated Human Remains Transfer Case (CHRT) to verify Service Requirements, assess market research, provide an independent cost estimate and validate Acquisition Strategy. Conduct an industry day to communicate the acquisition strategy for the CHRT to commercial vendors and provide context to an upcoming Request for Proposal for remains packaging solutions.</p> <p><b>FY 2018 Plans:</b> Award contract to CHRT vendor(s) to develop a solution to meet all packaging and transport requirements, conduct System Requirements Review, begin competitive prototyping, and continue product development for both program components.</p>	-	0.500	3.210
<p><b>Title:</b> 2) CHRS - CHRDS</p> <p><b>FY 2018 Plans:</b> Award contract to develop a solution to identify system integrator for CHRDS, conduct System Requirements Review, begin competitive prototyping, and continue product development for both program components.</p>	-	-	4.215
<p><b>Title:</b> 3) TACDS</p> <p><b>FY 2018 Plans:</b> Prepare Pre-Milestone A acquisition documents.</p>	-	-	0.701
<p><b>Title:</b> 4) TACDS</p> <p><b>FY 2018 Plans:</b> Develop lifecycle sustainment plan.</p>	-	-	0.825
<p><b>Title:</b> 5) TACDS</p> <p><b>FY 2018 Plans:</b></p>	-	-	0.825



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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> DE4 / DECONTAMINATION SYSTEMS (ACD&P)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Develop a Request for Proposal (RFP) and Statement of Work (SOW) for Technology Maturation and Risk Reduction (TMRR) contract.			
<b>Title:</b> 6) TACDS <b>FY 2018 Plans:</b> Provide System Engineering and Program Management.	-	-	0.124
<b>Title:</b> 7) JBADS - System Design Support <b>FY 2016 Accomplishments:</b> Initiated developmental testing (DT) to evaluate the efficacy of chemical agent hot air decontamination on several materials of interest.	1.142	-	-
<b>Title:</b> 8) JBADS - Prototype <b>FY 2016 Accomplishments:</b> Designed, fabricated, constructed and operated one prototype to assess the feasibility of a forward deployed and mobile chemical and biological decontamination capability.	1.611	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	2.753	0.500	9.900

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• DE5: DECONTAMINATION SYSTEMS (EMD)	16.015	9.984	15.686	-	15.686	13.074	12.461	11.253	10.543	Continuing	Continuing
• JD0050: DECONTAMINATION FAMILY OF SYSTEMS (DFoS)	0.000	7.602	7.285	-	7.285	12.035	13.414	10.869	9.645	Continuing	Continuing
• JD0063: CONTAMINATED HUMAN REMAINS POUCH (CHRP)	1.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	1.100
• JD0070: JOINT BIOLOGICAL AGENT DECONTAMINATION SYSTEM (JBADS)	0.000	3.000	4.827	-	4.827	1.000	24.648	2.377	1.364	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
CONTAMINATED HUMAN REMAINS SYSTEM (CHRS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> DE4 / <i>DECONTAMINATION SYSTEMS (ACD&amp;P)</i>
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The CHRS will consist of two separate approaches for the Contaminated Human Remains Transfer Case (CHRT) and the Contaminated Human Remains Decontamination System (CHRDS). The CHRT will use Competitive Prototyping (CP) to evaluate multiple alternatives in the Technology Maturation and Risk Reduction phase (Minimum TRL level of 4) that can meet the Contamination Mitigation (ConMit) ICD requirements. A solution will be chosen at Milestone B and developed under a cost plus incentive fee contract in the Engineering Manufacturing Development phase with incentives for weight reduction and processing time. The CHRDS will consist of a request for proposal to assemble Commercial Off the Shelf (COTS) and Government Off the Shelf (GOTS) components for a Contaminated Human Remains Decontamination System using a best value firm-fixed price contracting strategy.

**TACTICAL DISABLEMENT SYSTEM (TACDS)**

(1) The Tactical Disablement System (TACDS) shall be designed to meet the warfighters Chemical Materials of Concern (CMOC) destruction needs. Utilizing mature technologies, the TACDS program will take an incremental approach towards the development, integration, test and production of a family of systems (FoS). Developmental efforts in the Technology Maturation and Risk Reduction Phase (TMRR), as well as, the Engineering and Manufacturing Development Phase (EMD) will be contracted through full and open competition.

(2) The Production & Deployment Phase and the Operations and Support Phase would be a separate full and open competition as well.

**JOINT BIOLOGICAL AGENT DECONTAMINATION SYSTEM (JBADS)**

For Increment I, the program will leverage the Joint Biological Agent Decontamination System Joint Capability Demonstration (JCTD) and prior testing of candidate technologies to support a Milestone B decision in Engineering and Manufacturing Development (EMD), then a first article build to be retrofitted for fielding, if necessary, after a successful Operational Test and Fielding Decision.

JBADS Increment II will expand the biological agent decontamination capability to other platforms such as tactical and rotary wing aircraft, as well as ground vehicles. In addition, Increment II will provide chemical agent decontamination capabilities. Increment II will enter the acquisition process at Milestone B and a full and open Cost Plus Fixed Fee contract will be awarded to conduct the EMD phase. Candidate technologies will be evaluated during EMD to determine the most cost effective combination of biological and chemical agent decontamination for a variety of platforms. Following Milestone C/LRIP decision, a single, Firm Fixed Price production contract with full and open competition will be awarded.

**E. Performance Metrics**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)				<b>Project (Number/Name)</b> IP4 / INDIVIDUAL PROTECTION (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IP4: INDIVIDUAL PROTECTION (ACD&P)	-	5.473	3.235	5.145	-	5.145	0.000	0.000	2.949	5.604	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project provides for Advanced Component Development and Prototypes (ACD&P). Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

Efforts included in this project are: (1) the Uniform Integrated Protection Ensemble Increment 2 (UIPE Increment 2).

The UIPE Increment 2 program will develop, procure, and field a Family of Systems (FoS) that provides tailorable, full body, percutaneous protection. The FoS will address all Department of Defense mission profiles that could encounter chemical, biological, radiological and nuclear threats, to include contingency and humanitarian operations. The ability to integrate with and protect individual Warfighter kits as part of the protective ensemble will be a critical function of solutions. This will give the Warfighters the ability to perform their mission functions in a CBRN environment while preserving their Warfighter kit to the maximum extent possible after departing a CBRN environment. The FoS will be developed based on Service mission profiles that will be agreed upon by Stakeholders.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) UIPE - Increment 2	5.473	3.235	5.145
<b>Description:</b> Concept Design Evaluation/Technology Maturation and Risk Reduction			
<b>FY 2016 Accomplishments:</b> Performed a collaborative analysis of alternatives with Army Materiel Systems Analysis Activity to identify Warfighter needs in chemical and biological protective clothing. Participated in an enhanced concept demonstration with Services to gain user feedback. Completed initial trade space analysis on materials that will inform a down select decision of viable material and closure candidates and inform requirements development. Initiated garment design concept activities. Awarded a contract to develop a Challenge competition that will seek innovative design solutions from non-traditional sources. Designed, fabricated, and developed thirty (30) prototype Tactical Advanced Threat Protective Ensembles (TATPE) to support Concept Demonstrations to assess the ensembles' ability to meet user requirements, evaluate component integration, identify potential trade space, and refine system design. Conducted Milestone A decision.			
<b>FY 2017 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> IP4 / INDIVIDUAL PROTECTION (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue design concept activities. Begin concept development and design and begin preliminary testing on materials and prototypes. Conduct Systems Requirements Review (SRR), and Joint Independent Logistics Self-Assessment.			
<b>FY 2018 Plans:</b> Initiate and complete Gated Material Test to determine capability solutions that will enter into the Design Phase. Activities scheduled in the Design Phase include: Perform Design Verification Testing, Review Prototype Designs, Detailed Design, and Design Lockdown.			
<b>Accomplishments/Planned Programs Subtotals</b>	5.473	3.235	5.145

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• IP5: INDIVIDUAL PROTECTION (EMD)	19.720	11.427	14.481	-	14.481	9.953	5.471	4.709	3.556	Continuing	Continuing
• JI0002: JS AIRCREW MASK (JSAM)	2.705	52.284	36.782	-	36.782	54.775	60.278	63.806	63.110	Continuing	Continuing
• JI0003: JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)	60.184	55.118	48.493	-	48.493	16.927	18.166	0.000	0.000	0	198.888
• MA0401: CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)	32.872	13.525	10.990	-	10.990	13.064	16.769	19.336	71.335	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)

The UIPE Increment 2 Family of Systems (FoS) will use an evolutionary acquisition strategy to develop a FoS that will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional CBRN threats. The FoS will be developed based on Service mission profiles with the goal being to minimize operational burden and provide improved fit, function, and integration with the current Warfighter kits compared to legacy systems. Pre-Milestone A activities included the exploration of available state of the art technologies through market research, Requests for Information, and a challenge competition; shaping realistic requirements by exploring trade space of novel technologies; and identified protection offered by non-chemical biological (CB) combat gear. The Technology Maturation and Risk Reduction (TMRR) phase will reduce technology, engineering, integration, and life-cycle cost risk. During this phase, the program will focus on forming mission profile areas designed to narrow the focus of solutions designed specifically for a certain Warfighter functional area. UIPE Increment 2 is a FoS and, therefore, will not be a

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> IP4 / <i>INDIVIDUAL PROTECTION (ACD&amp;P)</i>
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single solution designed to have one suit meet the majority of Warfighter functions. Early testing will aide in deciding what is possible for each mission profile area and feed information in to the trade space analysis. Developmental/Operational Testing will assess the ability of the solution to meet requirements, determine contractual compliance with the Performance Specifications, demonstrate system technical performance in accordance with the operational requirements, and demonstrate performance in realistic conditions. An Other Transaction Authority (OTA) contracting approach will be used to procure informational white papers during the TMRR phase, prototypes, and test articles of possible solutions. The OTA consists of a consortium of all potential Industry, research institutions, and non-traditional government that could be potential solvers for the program. Procurement will be through either the OTA or a more traditional contracting vehicle. In special circumstances, procurement may be awarded under the OTA if the contract falls under the procedures pursuant to the rules and regulations specified for this OTA. Otherwise, a production contract will be awarded via a more traditional contracting vehicle.

**E. Performance Metrics**

N/A

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**Exhibit R-2A, RDT&E Project Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> IS4 / INFORMATION SYSTEMS (ACD&P)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
IS4: INFORMATION SYSTEMS (ACD&P)	-	7.224	5.928	5.941	-	5.941	0.872	0.297	0.077	0.072	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project provides for Advanced Component Development and Prototypes (ACD&P) responsible for providing the information architecture and applications for shaping the battlespace against the Chemical, Biological, Radiological and Nuclear (CBRN) threat. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

Efforts included in this project are: (1) the Biosurveillance Portal (BSP); (2) the Joint Effects Model (JEM); (3) the Joint Warning and Reporting Network (JWARN); and (4) the Software Support Activity (SSA).

The Biosurveillance Portal (BSP) is an FY 2016 new start program to address USSOCOM requirements contained in an approved Information Systems Capability Development Document (IS CDD). BSP is a web-based enterprise environment that will facilitate collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological events. BSP bridges the communication gaps in the biosurveillance domain to provide a central access point for biosurveillance information and situational awareness for DoD, interagency and allied partners supporting the early identification and response to biological events.

BSP provides an integrated suite of web-based components designed to support public health officers, environmental officers, clinicians, physicians, and CBRN personnel as they maintain their situational awareness of local, regional, and global biological threats to the force. BSP does not duplicate existing DoD capabilities, but rather leverages existing tools and technologies to provide users across multiple organizations and disciplines with a centralized "one-stop shop" for all of their biosurveillance resources.

The Joint Effects Model (JEM) is a web-based software application that supplies the Department of Defense (DoD) with the one and only accredited tool to effectively model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. JEM is capable of providing all Warfighters with the ability to accurately model and predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM) events and effects. JEM supports planning to mitigate the effects of Weapons of Mass Destruction (WMD) and to provide rapid estimates of hazards and effects into the Common Operational Picture (COP).

Follow-on increments of JEM will refine and display hazard areas in near real time to reflect inputs such as meteorological, oceanographic, or actual agent concentration data. JEM will automatically receive input data from the Command, Control, Communications, Computers and Intelligence (C4I) system on which it resides, such as historical climatology, local observations, weather forecasts, natural environmental threats (i.e.: pandemic influenza, etc.), terrain data, intelligence information, or population data. JEM will also allow manual user input for factors such as concentrations of chemical warfare agents or actual exposure measurements and forecast sheltering stay-times and provide for modeling sheltering time through user-defined scenarios.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> IS4 / INFORMATION SYSTEMS (ACD&P)

The Joint Warning and Reporting Network (JWARN) is an accredited Department of Defense (DOD) warning and reporting system that provides a standardized warning and reporting capability for Chemical, Biological, Radiological and Nuclear (CBRN) and Toxic Industrial Materials (TIM) incidents.

JWARN supports the Joint Force Commander (JFC) by improving force protection capabilities for units operating in chemical, biological, radiological and nuclear environments. JWARN provides an over-layer of NBC 1-6 reports on the Common Operational Picture, displayed through Service provided C4I systems resident at all echelons of command. JWARN will be operated by CBRN and non-CBRN trained personnel operating in the operations center at various command nodes. This provides commanders with situational awareness to inform decision making for force protection criteria, unmasking operations, decontamination, and continuity of operations in a contaminated environment. Future sensor configurations will forward sensor inputs directly to JWARN via established communication lanes, removing the man-in-the-loop requirement with the current system configuration. JWARN will be information system classification agnostic and must be able to operate on unclassified, secret, top secret, and mission partner IT Systems without increasing system operator requirement, i.e.: sensor to COP via one communication loop. As a result, sensors will then be able to communicate with JWARN on the same network, regardless of classification.

The Software Support Activity (SSA) is a Chem-Bio Defense user developmental support and service organization to facilitate net-centric interoperability of systems in acquisition for the Warfighter. The SSA provides the CBRN Warfighter with Joint Service solutions for Cybersecurity/Information Assurance (IA), Integrated Architectures, Data Management/Modeling, Interoperability Certifications, Verification, Validation and Accreditation (VV&A) to support interoperable and integrated net-centric, service-oriented solutions for CBRN systems. The SSA emphasizes development of reference implementations to guide Government and industry system and software developers to ensure that their products meet common interoperability standards. The latest technologies/products include the definition of a Common CBRN Sensor Integration Standard (CCSI) and the CBRN Data Model. These technologies and direct enablers for the development of CBRN integrated sensor networks and the dissemination of CBRN information across all users. The SSA directly supports Chemical and Biological Defense Program (CBDP) initiatives by providing common service oriented architectures and frameworks for the collection and dissemination of Bio-Surveillance and other critical CBRN information.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) BSP Program Management  <b>FY 2016 Accomplishments:</b> Managed oversight of technology development and transition efforts for new technologies and capabilities designed to satisfy BSP requirements.  <b>FY 2017 Plans:</b> Continue management and oversight of technology development and transition efforts for new technologies and capabilities designed to satisfy BSP requirements.  <b>FY 2018 Plans:</b> Continue management and oversight of technology development and transition efforts for new technologies and capabilities designed to satisfy BSP requirements.	0.373	0.379	0.382
<b>Title:</b> 2) BSP Product Development	0.687	0.721	0.693

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> IS4 / INFORMATION SYSTEMS (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Prototyped, developed, and evaluated new technologies, models, and tools from both internal and external developers for transition into BSP.</p> <p><b><i>FY 2017 Plans:</i></b> Continue prototyping, developing, and evaluating new technologies, models, and tools from both internal and external developers for transition into BSP. Two planned technology transitions from the Tech Base in FY17 and two in FY18.</p> <p><b><i>FY 2018 Plans:</i></b> Continue prototyping, developing, and evaluating new technologies, models, and tools from both internal and external developers for transition into BSP. Two planned technology transitions from the Tech Base in FY17 and two in FY18.</p>			
<p><b><i>Title:</i></b> 3) JEM Increment 2 - Prototyping and Development</p> <p><b><i>FY 2016 Accomplishments:</i></b> Developed JEM Increment 2 software capabilities defined in Requirements Definition Package 1 (RDP 1). RDP 1 is the JEM Increment 2 Standalone Capabilities package considered the JEM Increment 2 Baseline. It contains all the JEM Increment 1 capabilities plus additional Incident Source Models (ISMs)(Missile Intercept, High Altitude Release, Nuclear Reactor Facility Release). Performed integration into C2 systems as defined in Requirements Definition Package 2. RDP-2 is the package that takes RDP 1 and integrates it with various C2 Host Systems (MilCloud, Army, GCCS-J, etc.). Began software development of capabilities defined in Requirements Definition Package 3 that support Science and Technology community use of JEM Increment 2 software. RDP 3 is a package dedicated to Analytical Support for the "super user" group.</p> <p><b><i>FY 2017 Plans:</i></b> Complete development and integration of capability JEM Increment 2 software development of capabilities defined in Requirements Definition Package 1. Continue integration into C2 systems as defined in Requirements Definition Package 2 (RDP 2) which is the C2 Integration RDP, as Service command and control hosts become available for integration. RDP-2 defines requirements to integrate baseline capabilities into a version that can be fielded on service C2 systems. Continue development of capabilities defined in Requirements Definition Package 3 that support Science and Technology community use of JEM Increment 2 software. Begin integration of emerging science and technology capabilities received from Advanced Technical Development (ATD) phase and defined in Requirements Definition Package 3 and 4.</p> <p><b><i>FY 2018 Plans:</i></b> Continue integration of emerging science and technology capabilities received from Advanced Technical Development (ATD) phase and defined in Requirements Definition Package 3 and 4.</p>	1.184	0.592	0.115
<p><b><i>Title:</i></b> 4) JEM Increment 2 - Test &amp; Evaluation (T&amp;E)</p>	1.201	0.246	-



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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>FY 2016 Accomplishments:</b> Conducted lab based OT and limited scope service specific IOT&amp;E to support fielding of software with additional capability in 1QTR FY17. Conduct Service C2 Follow-on Test and Evaluation (FOT&amp;E) which will allow for IOC of JEM Increment 2 on service C2 systems in 1QTR FY17.</p> <p><b>FY 2017 Plans:</b> Continue Government development test on newly integrated models received from the Tech Base. Continue lab based warfighter events to assess usability and suitability of implementation of new models.</p>			
<p><b>Title:</b> 5) JEM Increment 2 - Management Support</p> <p><b>FY 2016 Accomplishments:</b> Completed Fielding Decision and IOC of Stand Alone capabilities of JEM Increment 2 in 1QTR FY16. Performed program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM Increment 2.</p> <p><b>FY 2017 Plans:</b> Continue to perform program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM Increment 2. Continue to manage transition of mature science and technology from into the JEM increment 2 program.</p>	0.323	0.242	-
<p><b>Title:</b> 6) JEM Increment 2 - Technical Support</p> <p><b>FY 2016 Accomplishments:</b> Developed VV&amp;A package for JEM Increment 2.</p> <p><b>FY 2017 Plans:</b> Update VV&amp;A plans and perform V&amp;V to ensure models are mature enough to be integrated into the JEM Increment 2 baseline.</p>	0.553	0.257	-
<p><b>Title:</b> 7) JWARN Increment 2 - Prototyping</p> <p><b>FY 2016 Accomplishments:</b> Continued software prototyping efforts supporting JWARN baseline development.</p> <p><b>FY 2017 Plans:</b> Continue software prototyping efforts supporting JWARN development for all three Requirements Definition Packages (RDPs).</p> <p><b>FY 2018 Plans:</b> Continue software prototyping efforts supporting JWARN development for all three Requirements Definition Packages (RDPs).</p>	0.755	0.918	0.834
<p><b>Title:</b> 8) JWARN Increment 2 - Product Development</p> <p><b>FY 2016 Accomplishments:</b></p>	0.334	0.420	1.383

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued JWARN Technology Demonstrations and User Assessments to evaluate and prove component and subsystem maturity of critical science and technology, system performance, and validate requirements within the IT BOX construct and Agile Process developed software prototype(s).  <b>FY 2017 Plans:</b> Continue JWARN Technology Demonstrations and User Assessments to evaluate and prove component and subsystem maturity of critical science and technology, system performance, and validate requirements within the IT BOX construct and Agile Process developed software prototype(s).  <b>FY 2018 Plans:</b> Continue JWARN Technology Demonstrations and User Assessments to evaluate and prove component and subsystem maturity of critical science and technology, system performance, and validate requirements within the IT BOX construct and Agile Process developed software prototype(s).			
<b>Title:</b> 9) JWARN Increment 2 - Test and Evaluation (T&E)  <b>FY 2016 Accomplishments:</b> Continued Government developmental testing and analysis of component and subsystem maturity, to include Technology Readiness Assessment(s), of software submitted for evaluation during prototyping. Continue the DoD Information Assurance Certification and Accreditation and Joint Interoperability Certification process. Conduct Initial Operational Test and Evaluation (IOT&E) of Capability Drops 1.1 and 1.2 for the USA, USMC and USAF.  <b>FY 2017 Plans:</b> Continue Government developmental testing and analysis of component and subsystem maturity, to include Technology Readiness Assessment(s), of software submitted for evaluation during prototyping. Continue the DoD Information Assurance Certification and Accreditation and Joint Interoperability Certification process. Conduct Initial Operational Test and Evaluation (IOT&E) of Capability Drops 1.3 for USA, USMC, USAF and 2.1 for USA, USMC, USAF, and USN.  <b>FY 2018 Plans:</b> Continue Government developmental testing and analysis of component and subsystem maturity, to include Technology Readiness Assessment(s), of software submitted for evaluation during prototyping. Continue the DoD Information Assurance Certification and Accreditation and Joint Interoperability Certification process. Conduct Operational Test and Evaluation (OT&E) of Capability Drop (CD) 1.4 for USA, USMC, USAF and (CD) 2.2 & 2.3 for USA and Joint C2 Host Systems.	0.443	0.556	0.744
<b>Title:</b> 10) JWARN Increment 2 - Program Management Support  <b>FY 2016 Accomplishments:</b>	0.494	0.620	0.657

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Provided strategic, tactical planning, program/financial management, costing, contracting, scheduling, acquisition oversight, and milestone documentation for the program within IT BOX construct and Agile Software development process.</p> <p><b>FY 2017 Plans:</b> Provide strategic, tactical planning, program/financial management, costing, contracting, scheduling, acquisition oversight, and milestone documentation for the program within IT BOX construct and Agile Software development process. Re-compete contract for prime developer.</p> <p><b>FY 2018 Plans:</b> Continue to provide strategic, tactical planning, program/financial management, costing, contracting, scheduling, acquisition oversight, and milestone documentation for the program within IT BOX construct and Agile Software development process. Award Re-compete contract for prime developer.</p>			
<p><b>Title:</b> 11) JWARN Increment 2 - Technical Support</p> <p><b>FY 2016 Accomplishments:</b> Continued providing engineering and technical support for JWARN development under the IT BOX construct and Agile Software development processes. Continued independent system verification, validation, and class type accreditation as required.</p> <p><b>FY 2017 Plans:</b> Continue to provide engineering and technical support for JWARN development under the IT BOX construct and Agile Software development processes. Continue independent system verification, validation, and class type accreditation as required.</p> <p><b>FY 2018 Plans:</b> Continue to provide engineering and technical support for JWARN development under the IT BOX construct and Agile Software development processes. Continue independent system verification, validation, and class type accreditation as required.</p>	0.778	0.877	1.037
<p><b>Title:</b> 12) SSA Integrated Architecture</p> <p><b>FY 2016 Accomplishments:</b> Modified the integrated Architecture on host platforms, documented the infrastructure and technical standards, and developed an iteration of the acquisition IA strategy.</p> <p><b>FY 2017 Plans:</b> Continue required modifications to the integrated Architecture on host platforms and document the infrastructure and technical standards, developing an acquisition Cybersecurity/IA strategy.</p> <p><b>FY 2018 Plans:</b></p>	0.099	0.100	0.096

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue required modifications to the integrated Architecture on host platforms and document the infrastructure and technical standards, developing an acquisition Cybersecurity/IA strategy.			
<b>Accomplishments/Planned Programs Subtotals</b>	7.224	5.928	5.941

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

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• IS5: INFORMATION SYSTEMS (EMD)	20.043	27.323	25.677	-	25.677	23.281	22.542	18.221	14.006	Continuing	Continuing
• IS7: INFORMATION SYSTEMS (OP SYS DEV)	7.556	10.357	12.203	-	12.203	15.552	16.951	16.492	15.163	Continuing	Continuing
• G47101: JOINT WARNING & REPORTING NETWORK (JWARN)	0.000	3.889	0.981	-	0.981	0.502	0.445	0.400	0.375	Continuing	Continuing
• JC0208: JOINT EFFECTS MODEL (JEM)	3.316	3.069	0.983	-	0.983	0.911	0.696	0.731	0.746	Continuing	Continuing
• JS5230: SOFTWARE SUPPORT ACTIVITY (SSA)	0.100	0.300	0.096	-	0.096	0.094	0.082	0.075	0.071	Continuing	Continuing
• JX0301: BIOSURVEILLANCE PORTAL (BSP)	1.620	1.220	1.171	-	1.171	1.148	1.133	1.018	0.716	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

BIOSURVEILLANCE PORTAL (BSP)

The Biosurveillance Portal (BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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**JOINT EFFECTS MODEL (JEM)**

JEM Increment 2 acquisition will utilize the JROC's "IT Box" construct for software development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and fielding products to the service more frequently than an incremental delivery approach.

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

As part of this strategy a single JEM integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in December 2013.

The current contractor for JEM Increment 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The follow-on contract in FY17 will include scope for developing the remaining capabilities under the JEM 2.0 contract. The JEM follow-on contract will utilize full and open competition and will be referred to as the JEM development, modernization and sustainment contract.

An over-arching MS B and Build Decision for RDP-1 were approved by the MDA in Q4 FY14, and a CD1.1 Fielding Decision and a RDP-2 Build Decision were approved in Q3 FY16. Each subsequent RDP will have a single Build Decision and each CD will have an associated Fielding Decision.

**JOINT WARNING & REPORTING NETWORK (JWARN)**

JWARN Increment 2 utilizes the JROC's "IT Box" construct for software requirements management and development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and away from an incremental delivery approach. This effort is being executed under a Cost-Plus-Award Term Incentive structure to gain maximum benefit to the Government in maintaining the fielded baseline and future software capability development and was awarded under a full and open competition Request for Proposal (RFP).

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 4	PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	IS4 / <i>INFORMATION SYSTEMS (ACD&amp;P)</i>

C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

The JWARN Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

**SOFTWARE SUPPORT ACTIVITY (SSA)**

The SSA provides enterprise-wide services and coordination across all CBDP programs that contain data or software, or are capable of linking to the Global Information Grid (GIG). The SSA facilitates interoperability, integration, and supportability of existing and developing IT and National Security Systems (NSS). This will be followed by coordination to facilitate the concepts of interoperability, integration and supportability of enterprise-wide services. Next follows work with user communities to develop and demonstrate enterprise-wide common architectures, products and services. The SSA will support the application of the enterprise-wide architectures, products and services into the programs, with verification of compliance with the defined products and services.

**E. Performance Metrics**

N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MB4: MEDICAL BIOLOGICAL DEFENSE (ACD&P)	-	68.160	65.648	83.999	-	83.999	46.501	25.715	34.090	48.338	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project includes medical countermeasures, development of reagents, assays, diagnostic equipment, biosurveillance and supporting efforts.

This Advanced Component Development and Prototypes (ACD&P) Project supports:

The Antiviral Therapeutics (AV TX) Program will combine the efforts of the Emerging Infectious Diseases Therapeutics Program and the Hemorrhagic Fever Virus Program into a consolidated effort to develop and deliver FDA approved antiviral therapeutics for the warfighter, beginning in FY17. Drug products will be developed targeting the pathogens on the biological warfare threat lists, such as Ebola. This includes viruses of interest from the following families: Filoviridae, Alphaviridae, Arenaviridae, Bunyaviridae, and Flaviviridae. Developed antiviral therapeutics will be employed after suspected or confirmed exposure to the relevant threat agents and AV TX MCMs will ameliorate the effect of threat agents to the warfighter. In the event of a natural occurring outbreak, antiviral therapeutics can be provided to ensure freedom of operation.

The Medical Countermeasure BSL-4 GLP Test and Evaluation capability performs T&E and provides the essential data packages to support US Food and Drug Administration approval of leading biodefense medical countermeasure candidates to protect the Warfighter and the Nation. This capability provides dedicated capacity for DoD to conduct biosafety level-4 (BSL-4) Good Laboratory Practice (cGLP) T&E studies to meet programmatic needs following all applicable regulatory, biosurety, and safety standards.

The Agile Medical Paradigm (AMP) is the CBDP's strategic framework to accelerate the delivery of MCMs. To achieve this goal the DOD is establishing a medical countermeasures platform (MCMPT) capability. The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. Efforts will center on leveraging the DoD's Advanced Development Manufacturing (ADM) facility and developing robust manufacturing processes.

The Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B) program develops medical countermeasures (MCMs) for Service members for protection against multi-drug resistant (MDR) bacteria, including Biological Warfare Agents (BWAs) and organisms that are genetically modified to be MDR and resulting bio-toxins. The resulting product(s) will be US Food and Drug Administration (FDA)-approved to prevent or minimize effects of MDR bacterial exposures.

The NGDS Family of Systems program provides Chemical, Biological and Radiological (CBR) threat and infectious disease diagnostic capabilities across several echelons of care, as well as for environmental sample analysis as part of the Common Analytical Laboratory System (CALs). The NGDS Increment 1 provides an U.S. Food and Drug Administration (FDA)-cleared reusable, portable biological pathogen diagnostic system to Army, Air Force and Navy deployable Combat Health

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Support units, to support near real-time patient treatment decision making, force health protection decision making and CBRN situational awareness. NGDS Increment 2 will complement NGDS Increment 1 by developing diagnostics for unmet biological pathogen and toxin threats, chemical and radiological exposures, and to provide capability to lower echelons of care.

The Department of Defense (DoD) supports the Technology Maturation and Risk Reduction (TMRR) phase for vaccines that are directed against validated biological warfare (BW) weapons to include bacteria, viruses, and toxins of biological origin. Effective medical countermeasures are urgently needed to negate the threat of these biological warfare (BW) agents. Vaccines have been identified as the most efficient countermeasure against the validated threat of BW weapons.

The Filovirus Vaccine (VAC FILO) Program develops vaccines that will offer protection against the threat of Ebola and Marburg viruses. The program office is prioritizing the development and delivery of a licensed Marburg vaccine while S&T further develops Ebola vaccine candidates to meet the DoD requirement. The current budget supports development of multiple Marburg prototypes to protect against the BW threat through TMRR phase. The DoD anticipates that the Food and Drug Administration (FDA) will approve a vaccine using the Animal Rule, which allows for the demonstration of efficacy in a relevant animal model(s).

The Ricin toxin is a validated bioweapon threat that is lethal, available and easily produced. The Ricin vaccine program (VAC Ricin) supports one DoD vaccine candidate including manufacturing cGMP lots; and the continuation of animal model and assay development studies. The Ricin Vaccine will protect the Warfighter against aerosolized exposure to ricin toxin.

The Western, Eastern, and Venezuelan Equine Encephalitis (VAC WEVEE) Vaccine program initiated competitive prototypes in FY13 to reduce program risk, and is developing multiple prototypes through the Technology Development Phase. The Western, Eastern, and Venezuelan Equine Encephalitis (VAC WEVEE) Vaccine will protect the Warfighter against aerosolized exposure to three strains of alphaviruses; western, eastern and Venezuelan equine encephalitis viruses. The program office is prioritizing the development and delivery of a licensed VEE vaccine.

Anthrax is a validated bioweapon threat for which the Force is being vaccinated against. The current anthrax dose schedule requires up to 6 doses to be fully protective. Health and Human Services has developed a next generation vaccine for post exposure to anthrax. The DoD is seeking to leverage HHS development efforts and extend the label to pre-exposure to anthrax. This will allow both the civilian and military populations to maintain the same standard of care.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) MCMPT  <b>FY 2018 Plans:</b> Initiate development of standardized design capabilities to support a rapid response.	-	-	0.500
<b>Title:</b> 2) BSL-4 GLP T&E  <b>FY 2016 Accomplishments:</b> Continued to provide strategic planning, program management, and scheduling for GLP BSL-4 T&E capability, conducted secondary capability assessments, developed and implemented CONOPS and plans for transition to new facility, conducted GLP	6.118	6.454	5.885



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>BSL-4 T&amp;E medical countermeasure studies in a safe and secure environment, implemented electronic scheduling tool, PCR Core fully implemented, developed Data Management System, hired additional personnel, and fully validated four instruments.</p> <p><b>FY 2017 Plans:</b> Conduct two GLP BSL-4 T&amp;E medical countermeasure non-human primate studies in a safe and secure environment, continue to establish core capabilities, continue validation of supporting assays, provide strategic planning, program management, and scheduling for GLP BSL-4 T&amp;E capability, develop CONOPS and plans for transition to new facility.</p> <p><b>FY 2018 Plans:</b> Conduct two GLP BSL-4 T&amp;E medical countermeasure non-human primate studies in a safe and secure environment, implement laboratory draw-down and transition to new facility, continue to provide strategic planning, program management, and scheduling for GLP BSL-4 T&amp;E capability.</p>				
<p><b>Title:</b> 3) CMDR-B</p> <p><b>FY 2016 Accomplishments:</b> Established Cooperative Teaming Agreement (CoTA) with Defense Threat Reduction Agency (DTRA) for the efficacy testing of drug, Gepotidican, for Non-Human Primate Pivotal Animal Efficacy Testing for anthrax and tularemia; established partnership with Department of Health and Human Services/Biomedical Advanced Research and Development Authority (DHHS/BARDA) for the manufacture of developmental drug product that will support a Pre-Emergency Use Authorization (EUA) Package for a plague therapeutic for post-exposure protection and treatment; developed anti-bacterial Request for Prototype Proposal (RPP) for the Other Transaction Authority (OTA) Consortium; and in partnership with DTRA, funded activities that evaluated the pharmacokinetics of Omadacycline, a novel antibacterial, in non-human primates and for studies to assess efficacy for treatment of inhalation plague.</p> <p><b>FY 2017 Plans:</b> Continue the development of one or more MCM against MDR bacteria against one or more of the bacterial BWA (e.g., Bacillus anthracis, Yersinia pestis, Brucella spp., Burkholderia mallei, Francisella tularensis, and Burkholderia pseudomallei). Efforts will include IND Filing and Pilot Animal Studies.</p>		6.711	3.135	-
<p><b>Title:</b> 4) CMDR-B</p> <p><b>FY 2018 Plans:</b> Complete the manufacture of developmental drug product that will support a Pre-EUA Package for Y. Pestis.</p>		-	-	5.162
<p><b>Title:</b> 5) CMDR-B</p> <p><b>FY 2018 Plans:</b></p>		-	-	3.163

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Award anti-bacterial therapeutics prototype proposals under the JPM MCS OTA Consortium.				
<b>Title:</b> 6) NGDS 2 Family of Systems <b>FY 2018 Plans:</b> Develop and mature prototypes for Chemical Agent Diagnostics. Develop and mature single-use, disposable assays for BW targets.		-	-	4.950
<b>Title:</b> 7) VAC FILO <b>FY 2016 Accomplishments:</b> Continued and completed non-clinical efficacy and safety studies for competitive multiple candidates. <b>FY 2017 Plans:</b> Complete toxicology safety studies for multiple prototypes. Analyze clinical and nonclinical immunological data to establish a correlate of protection for each vaccine prototype. <b>FY 2018 Plans:</b> Continue clinical and nonclinical immunological testing to establish a correlate of protection for each Marburg vaccine prototype.		7.237	2.700	4.646
<b>Title:</b> 8) VAC FILO <b>FY 2016 Accomplishments:</b> Completed formulation development, assay qualification and cGMP pilot scale production of competitive candidates. Initiated stability testing. <b>FY 2017 Plans:</b> Complete assay qualification efforts in support of clinical trials. Continue stability testing. <b>FY 2018 Plans:</b> Optimize manufacturing processes for each Marburg vaccine prototype. Continue stability testing.		9.250	3.518	5.600
<b>Title:</b> 9) VAC FILO <b>FY 2016 Accomplishments:</b> Conducted pre-IND meeting with FDA on second prototype. Finalized and submitted IND to the FDA for competitive prototypes. Initiated Phase 1 clinical trials for competitive prototypes. Initiated and completed trivalent Phase 1 clinical trial. <b>FY 2017 Plans:</b>		9.243	2.500	5.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue phase 1 clinical study reports for each clinical trial conducted by 1QFY17 in support of Milestone B in 2QFY17. Conduct End of Phase 1 meetings with the FDA. <b>FY 2018 Plans:</b> Continue Phase 1 clinical trials for each Marburg vaccine prototype.				
<b>Title:</b> 10) VAC FILO <b>FY 2016 Accomplishments:</b> Continued to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight and technical support. <b>FY 2017 Plans:</b> Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight and technical support. <b>FY 2018 Plans:</b> Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight and technical support.		4.859	1.000	2.500
<b>Title:</b> 11) VAC NGA <b>Description:</b> Label indication extension of Nuthrax <b>FY 2018 Plans:</b> Extend the label to pre-exposure to anthrax		-	-	1.282
<b>Title:</b> 12) VAC RIC <b>FY 2016 Accomplishments:</b> Continued stability testing of GMP material. Initiated manufacturing technology transfer to the ADM capability. <b>FY 2017 Plans:</b> Continue stability testing of GMP material. Continue manufacturing technology transfer to the ADM capability. Continue animal model and assay development. <b>FY 2018 Plans:</b> Complete stability testing of GMP material which began in 2014 at University of Nebraska Lincoln and USARMIID. Finish manufacturing technology transfer to the ADM capability.		2.590	1.173	0.495
<b>Title:</b> 13) VAC WEVEE		8.716	3.227	4.911

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Continued non-clinical safety, efficacy and IND-enabling studies for competitive candidates.</p> <p><b><i>FY 2017 Plans:</i></b> Continue non-clinical safety, efficacy and IND-enabling studies for competitive prototypes. Utilize DOD ADM to release Phase I Clinical Trial material for Virus Like Particle (VLP) vaccine prototype. Initiate Phase 1 Clinical Trial for the VLP vaccine prototype.</p> <p><b><i>FY 2018 Plans:</i></b> Complete non-clinical safety, efficacy and IND-enabling studies for competitive prototypes. Continue Phase 1 Clinical Trail for the VLP vaccine prototype. Tech transfer manufacturing process for VLP vaccine candidate to the DOD ADM.</p>			
<p><b><i>Title:</i></b> 14) VAC WEVEE</p> <p><b><i>FY 2016 Accomplishments:</i></b> Continued small-scale manufacturing process development, and initiate GMP manufacturing for Virus Replicon Particle (VRP) prototype.</p> <p><b><i>FY 2017 Plans:</i></b> Complete cGMP production of bulk drug substance and formulation efforts. Initiate cGMP production of final drug product for competitive prototypes to support Phase 1 clinical trials. Complete assay development and initiate assay qualification efforts.</p> <p><b><i>FY 2018 Plans:</i></b> Continue Phase 1 Clinical Trial for Virus Replicon Particle (VRP) candidate.</p>	8.565	3.800	5.182
<p><b><i>Title:</i></b> 15) VAC WEVEE</p> <p><b><i>FY 2016 Accomplishments:</i></b> Initiated non-clinical toxicology study performed for VLP candidate.</p> <p><b><i>FY 2017 Plans:</i></b> Submit IND for additional prototypes and continue Phase 1 Clinical Trial.</p> <p><b><i>FY 2018 Plans:</i></b> Continue Phase 1 Clinical Trials for competitive prototypes.</p>	3.748	2.000	6.500
<p><b><i>Title:</i></b> 16) VAC WEVEE</p> <p><b><i>FY 2016 Accomplishments:</i></b></p>	1.123	2.390	2.480

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued strategic/tactical planning, Government system engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, regulatory and technical support. <b>FY 2017 Plans:</b> Continue strategic/tactical planning, Government system engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, regulatory and technical support. <b>FY 2018 Plans:</b> Continue strategic/tactical planning, Government system engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, regulatory and technical support.				
<b>Title:</b> 17) AV TX - Candidate 2 <b>FY 2017 Plans:</b> Conduct source selection activities and award contract for antiviral therapeutic countermeasure. Conduct pilot aerosol efficacy studies in a BSL 4. Conduct Phase 1 clinical safety trials and relevant toxicity studies. Initiate manufacturing process optimization activities for scale-up to meet DoD production requirements. Initiate Non-Human Primate (NHP) model enhancement to support approval under the FDA Animal Rule.		-	33.751	-
<b>Title:</b> 18) AV TX Candidate 2 <b>FY 2018 Plans:</b> Initiate dose ranging and additional efficacy studies in non-human primates (NHPs) for the treatment of Filovirus infections.		-	-	13.077
<b>Title:</b> 19) AV TX Enabling Technology <b>FY 2018 Plans:</b> Continue studies to identify biomarkers in NHPs exposed to Alpha viruses, and demonstration of relevance of the NHP model.		-	-	2.756
<b>Title:</b> 20) AV TX Enabling Technology <b>FY 2018 Plans:</b> Continue refinement of the marmoset model for inhalational Filovirus infections and testing of medical countermeasures (MCM) against infections.		-	-	2.213
<b>Title:</b> 21) AV TX Enabling Technology <b>FY 2018 Plans:</b> Continue pipeline drug screening to identify new candidates and accelerate product development in non-human primates.		-	-	7.697
<b>Accomplishments/Planned Programs Subtotals</b>		68.160	65.648	83.999

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**Exhibit R-2A, RDT&E Project Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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**C. Other Program Funding Summary (\$ in Millions)**

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB5: MEDICAL BIOLOGICAL DEFENSE (EMD)	80.412	106.223	136.553	-	136.553	107.315	141.385	170.160	146.138	Continuing	Continuing
• MB7: MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)	8.541	7.145	11.950	-	11.950	9.850	3.728	6.060	6.532	Continuing	Continuing
• JM2222: BIOSCAVENGER (BSCAV)	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	3.943	Continuing	Continuing
• JM6677: ADVANCED ANTICONVULSANT SYSTEM (AAS)	0.000	0.000	0.000	-	0.000	0.360	0.360	2.700	2.700	Continuing	Continuing
• JM8788: NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)	3.300	7.395	6.938	-	6.938	5.842	2.919	4.826	2.644	Continuing	Continuing
• JX0005: DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)	0.185	0.185	0.183	-	0.183	0.183	0.183	0.182	0.182	Continuing	Continuing
• JX0210: DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)	1.005	1.005	0.995	-	0.995	0.975	0.972	0.874	0.788	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

MCM PLATFORM TECHNOLOGIES (MCMPT)

The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. BA5 Efforts will focus on establishing advanced platform technologies within the DoD's Advanced Development Manufacturing (ADM) facility and evaluating that capability through nonclinical and clinical testing. The early stage efforts (BA4) are to develop standardized design capabilities to support a rapid response. Once established, future programs will be able to leverage this capability for the development of specific medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority through the medical OTA consortium.

BSL4 GOOD LABORATORY PRACTICES TEST & EVALUATION (BSL4 GLP T&E)

The Medical Countermeasure Systems (MCM) BSL-4 T&E capability continues to utilize and maintain the existing and planned new US Army Medical Research Institute of Infectious Diseases (USAMRIID) facility and staff. MCM BSL-4 T&E support costs during Phase 3 and beyond will be offset by costs from specific MCM development

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> MB4 / <i>MEDICAL BIOLOGICAL DEFENSE (ACD&amp;P)</i>
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programs where possible. The period of FY16 and beyond will continue secondary capability assessments and refinements and will focus on transition of the capability to the new USAMRIID facility, after which Full Operational Capability (FOC) will be reached.

**COUNTERMEASURES FOR DRUG RESISTANT BACTERIA (CMDR-B)**

The CMDR-B Program develops MCMs for MDR (multi-drug resistant) bacteria, including BWAs and organisms that are genetically modified to be MDR and resulting bio-toxins. The resulting product(s) will be US FDA approved to prevent or minimize effects from MDR bacterial exposures. The CMDR-B program will follow an integrated product development process, and undergo independent regulatory affairs processes to achieve an FDA approved drug. The CMDR-B program is establishing collaborative relationships with DoD, other USG entities, and commercial partners in order to populate the MDR pipeline which will help reduce program risk, potentially lower program cost, and accelerate delivery of MCMs to the Warfighter. Leveraging collaborative Department of Defense (DoD), United States Government, and industry efforts will reduce program risk, lower program cost, and accelerate the delivery of therapeutics to the Warfighter. The program has established a translational team with the Joint Science and Technology Office for animal model work and pipeline candidates that could transition to CMDR-B for Advanced Development. The CMDR-B program also has a partnership with DHHS/BARDA to manufacture developmental drug product that will support an Interim Fielding Capability for a plague therapeutic for post-exposure protection and treatment. The CMDR-B program intends to have a Milestone B Decision Review in 1QFY19. Results from the program investment in Non-Human Primate Pivotal efficacy testing, conducted in TMRR phase, in FY17 may result in Technical Readiness Level (TRL) 8 mature candidates being ready for further development; therefore the CMDR-B program is likely to request the MS B Decision Review moved up to FY18.

**NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)**

The NGDS Increment 1 program has a streamlined MS A to MS C - Limited Deployment acquisition strategy. The NGDS Increment 1 is intended to replace the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17.

The NGDS Increment 2 program addresses CBRN agents and concepts of employment (COEs) that the NGDS Increment 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBRN agent diagnostics across multiple echelons of care. NGDS Increment 2 will employ a system of systems approach to bridge identified capability gaps for man-portable diagnostics, complementary bench top diagnostics, chemical diagnostics, and handheld disposable diagnostics. NGDS Increment 2 will initiate engineering development of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. Separate decisions will be utilized to establish programs of record for bench top, chemical and handheld disposable diagnostic capability development, based on individual determinations of technology maturity to meet user requirements.

**FILOVIRUS (VAC FILO)**

The Filovirus Vaccine Program acquisition strategy supports the development of multiple vaccines through the Technology Maturation and Risk Reduction (TMRR) phase that will offer protection against the threat of Ebola and Marburg viruses. During this phase a manufacturing process is developed. This process will be used to produce current Good Manufacturing Practices (cGMP) lots suitable for Phase 1 clinical trials. In addition, animal safety and efficacy studies will be conducted to support an Investigational New Drug (IND) submission to the FDA and conduct Phase 1 clinical trials. These efforts will support a MS B decision and entry into the

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 4	PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	MB4 / <i>MEDICAL BIOLOGICAL DEFENSE (ACD&amp;P)</i>

Engineering, Manufacturing, and Development (EMD) phase. At Milestone B (MS B), the best Marburg vaccine prototype will be selected through a full and open competition to transition to the Engineering and Manufacturing Development (EMD) phase with the delivery of an FDA licensed Marburg vaccine. It is anticipated that the EMD phase contract will be a mix of Cost Plus and Fixed Price. In addition, the program office may leverage the Advanced Development and Manufacturing capability, and other DoD agencies and laboratories to include the United States Army Medical Research Institute of Infectious Diseases (USAMRIID). Following a successful MS B, the program will conduct manufacturing qualification/validation, expanded clinical and nonclinical testing, and assay qualification and validation efforts. These efforts will support the Biological Licensure Application (BLA) submission to the Food and Drug Administration (FDA) and licensure of a Marburg vaccine.

**NEXT GENERATION ANTHRAX VACCINE (VAC NGA)**

The next Generation anthrax vaccine program strategy supports extending the label indication on the Health and Human Services AVA vaccine, Nuthrax. This effort will result in a vaccine product that has an improved on-set of protection with reduction in the number of doses needed to confer protection. The label extension will allow the vaccine to be used for a pre-exposure event to anthrax which aligns with the current DoD vaccine policies. During the TMRR phase of development, efforts will focus on conducting non-clinical dose range finding studies to determine the optimal dose to support the pre-exposure indication. In the EMD phase of development, activities will include demonstration of a consistent manufacturing process for the pre-exposure dose and conduct Phase 3 human safety clinical trials. It is anticipated that the EMD phase contract will be a mix of Cost Plus and Fixed Price. These efforts will support the Biological Licensure Application (BLA) submission to the Food and Drug Administration (FDA) and licensure of a next generation vaccine.

**RICIN VACCINE (VAC RIC)**

The Ricin Vaccine Program acquisition strategy supports the development of a single vaccine through the Technology Maturation and Risk Reduction (TMRR) phase that will offer protection against the threat of aerosolized ricin toxin. The Government will serve as the integrator during the TMRR phase by managing and coordinating the various vaccine development efforts. Additionally, the Program Office will partner with DoD agencies and laboratories to include U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID).

**WESTERN EASTERN VENEZUELAN EQUINE ENCEPH VACCINE (VAC WEVEE)**

The WEVEE acquisition strategy uses a parallel evaluation of Virus Replicon Particle (VRP) and Virus Like Particle (VLP) vaccine prototypes through a Phase 1 clinical trials to achieve competitive prototyping in the Technology Development phase. Several potential decision points will be used to assess the prototypes for possible down select. The schedule is based on a down select to one prototype. The Government will serve as the integrator during this phase by managing and coordinating the various vaccine development efforts. At MS B, the best prototype will be selected through a full and open competition to transition to the Engineering and Manufacturing Development (EMD) phase, with delivery of a FDA-licensed WEVEE vaccine. The development efforts will be a Cost Plus and Firm Fixed Price CLINs. Additionally, the Program Office will partner with Health and Human Services/National Institute of Allergies and Infectious Diseases (HHS/NIAID), DoD agencies, and laboratories to include U.S. Army Medical Research Institute of Infectious Diseases (USMRIID). This DoD program is the Public Health Emergency Medical Countermeasures lead for the advanced development of this vaccine and is leveraging expertise across the Federal and International sectors to ensure programmatic success.



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> MB4 / <i>MEDICAL BIOLOGICAL DEFENSE (ACD&amp;P)</i>

ANTI-VIRAL THERAPEUTICS (AV TX)

The acquisition strategy combined the HFV and EID TX Program efforts beginning in FY17, into a single program to develop and deliver FDA approved antiviral countermeasures. Independent market research conducted in FY15 identified multiple candidates appropriate for advanced development at varying stages of maturity. A source selection was conducted targeting award in FY16. Candidates selected for entry into the EMD phase of development will be executed under the Antiviral Therapeutic program in FY17. Candidates selected which are appropriate for entry into the TMRR phase will be deferred for award until FY17 when BA4 funding is available to the program. The overall regulatory approach of the program remains to pursue development of products to FDA approval under the Animal Rule. The program will conduct human clinical safety studies, pilot and pivotal animal efficacy, and toxicology studies, required for FDA approval. The performers will submit New Drug Applications/Biologic License Agreements for the therapeutics during the EMD Phase. During the Production and Deployment phase, full rate manufacturing and stockpile production will be pursued. If the FDA mandates post-marketing surveillance studies, they will be conducted during Production and Deployment.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MCMPT - HW S - Rapid Response	C/CFFF	TBD : TBD	0.000	0.000		0.000		0.450	Jan 2018	-		0.450	Continuing	Continuing	0.000
CMDR-B - CMDR-B - Advanced Development Contract 1	C/CPIF	Glaxo Smith Kline : Columbia, MD	0.000	2.700	Sep 2016	2.221	May 2017	6.407	Feb 2018	-		6.407	Continuing	Continuing	0.000
CMDR-B - Pharmacokinetic studies of pathogens of interest and animal efficacy studies.	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	1.736	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - GSK Manufacturing	Various	Health and Human Services : Washington, DC	0.000	1.737	Sep 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - NGDS 2 Develop and mature prototypes for Chemical Agent Diagnostics	Various	TBD : TBD	0.000	0.000		0.000		4.950	Mar 2018	-		4.950	Continuing	Continuing	0.000
VAC FILO - HW S - Non Clinical Studies	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	15.143	2.487	Dec 2015	2.700	Dec 2016	4.114	Dec 2017	-		4.114	Continuing	Continuing	0.000
VAC FILO - SW GFPR - Manufacturing Multiple Prototypes	MIPR	Various : Various	4.169	8.685	Mar 2016	0.000		3.200	Dec 2017	-		3.200	Continuing	Continuing	0.000
VAC RIC - SW GFPR - Manufacturing Tech Transfer, animal model & assay development	Various	Various : Various	1.700	0.000		0.280	Mar 2017	0.240	Dec 2017	-		0.240	Continuing	Continuing	0.000
VAC WEVEE - HW S - Manufacturing and Process Development	MIPR	National Institute of Allergy & Infectious Diseases : Bethesda, MD	16.559	3.398	Dec 2015	3.300	Dec 2017	0.090	Dec 2017	-		0.090	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VAC WEVEE - HW S - Manufacturing and Process Development #2	MIPR	Battelle Memorial Institute : Columbus, OH	0.560	3.170	Dec 2015	1.000	Dec 2016	5.820	Dec 2017	-		5.820	Continuing	Continuing	0.000
AV TX - Candidate 2 - Pilot Aerosol Animal Efficacy Studies	C/CPIF	TBD : TBD	0.000	0.000		8.229	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 2 - Manufacturing Process Optimization and Scale Up	C/FP	TBD : TBD	0.000	0.000		10.084	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 2 - Phase 1 Safety Trials	C/CPIF	TBD : TBD	0.000	0.000		8.055	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 2 - Non Human Primate Animal Model Enhancement	C/CPIF	TBD : TBD	0.000	0.000		3.118	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 2 - Pilot Aerosol Animal Efficacy Studies #2	C/FP	Gilead Sciences : San Francisco, CA	0.000	0.000		0.000		10.062	Mar 2018	-		10.062	Continuing	Continuing	0.000
AV TX - Candidate 2 - Manufacturing Process Optimization and Scale Up	C/CPIF	University of Pittsburgh : Pittsburgh, PA	0.000	0.000		0.000		2.120	Dec 2017	-		2.120	Continuing	Continuing	0.000
AV TX - Candidate 2 - Phase 1 Safety Trials #2	C/CPIF	Defense Science & Technology Lab (DSTL) : Salisbury Wiltshire, UK	0.000	0.000		0.000		1.703	Mar 2018	-		1.703	Continuing	Continuing	0.000
AV TX - Candidate 2 - Non Human Primate Animal Model Enhancement #2	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	0.000		0.000		5.923	Mar 2018	-		5.923	Continuing	Continuing	0.000
<b>Subtotal</b>			38.131	23.913		38.987		45.079		-		45.079	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VAC FILO - ES S - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	MIPR	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	2.728	0.300	Dec 2015	0.350	Dec 2016	0.160	Dec 2017	-		0.160	Continuing	Continuing	0.000
VAC RIC - ES S - Regulatory Integration	MIPR	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	0.282	0.160	Dec 2015	0.090	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - ES S - Regulatory Integration	MIPR	National Institute of Allergy & Infectious Diseases : Bethesda, MD	2.878	0.100	Dec 2015	0.150	Dec 2016	0.600	Dec 2017	-		0.600	Continuing	Continuing	0.000
VAC WEVEE - ES S - Regulatory Integration #2	MIPR	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	0.170	0.123	Dec 2015	0.150	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			6.058	0.683		0.740		0.760		-		0.760	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BSL4 GLP T&E - DTE SB - T&E Facility	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	11.631	6.118	Dec 2015	6.454	Dec 2016	5.885	Dec 2017	-		5.885	Continuing	Continuing	0.000
VAC FILO - OTHT SB - Testing, Evaluation, and Clinical Trials	MIPR	Battelle Memorial Institute : Columbus, OH	29.587	7.730	Dec 2015	3.300	Dec 2016	5.424	Dec 2017	-		5.424	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VAC FILO - OTE C - Assay Development Prototype 1	C/CPIF	Various : Various	5.792	4.857	Dec 2015	2.000	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - OTE C - Assay Development Prototype 2	C/CPIF	Various : Various	5.856	2.200	Dec 2015	0.368	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - OTHT SB - Testing, Evaluation, and Clinical Trials#2, #3	C/CPIF	Various : Various	0.000	1.650	Mar 2016	0.000		3.437	Dec 2017	-		3.437	Continuing	Continuing	0.000
VAC NGA - DTE C - Non-Clinical Testing	C/CPFF	TBD : TBD	0.000	0.000		0.000		1.000	Jan 2018	-		1.000	Continuing	Continuing	0.000
VAC RIC - OTHT C - Phase 1b Clinical Study	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	1.450	0.000		0.803	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC RIC - OTHT C - Stability Testing	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	1.901	0.000		0.000		0.255	Dec 2017	-		0.255	Continuing	Continuing	0.000
VAC RIC - DTE C - Manufacturing Tech Transfer	Various	Various : Various	0.000	2.430	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - OTE C - Test and Evaluation Assay Development	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	8.619	5.453	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - OTE C - Test and Evaluation Assay Development #2	MIPR	Battelle Memorial Institute : Columbus, OH	6.527	5.260	Dec 2015	4.500	Dec 2016	6.000	Dec 2017	-		6.000	Continuing	Continuing	0.000
VAC WEVEE - OTE C - Clinical Trial (Prototype)	MIPR	Various : Various	2.170	0.900	Dec 2015	0.000		4.000	Dec 2017	-		4.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			73.533	36.598		17.425		26.001		-		26.001	-	-	0.000

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MCMPT - PM/MS S - Management	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.050	Jan 2018	-		0.050	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.215	0.000		0.223	Jan 2017	0.441	Jan 2018	-		0.441	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.177	0.215	Jan 2016	0.140	Jan 2017	0.218	Jan 2018	-		0.218	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Management Support #3	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.082	0.000		0.170	Jan 2017	0.563	Jan 2018	-		0.563	Continuing	Continuing	0.000
CMDR-B - PM/MS C - Contractor Systems Engineering/ Program Management Support	C/FP	Various : Various	0.000	0.323	Jan 2016	0.381	Jan 2017	0.696	Jan 2018	-		0.696	Continuing	Continuing	0.000
VAC FILO - PM/MS - Joint Vaccine Acquisition Program Management	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.140	0.250	Dec 2015	1.000	Dec 2016	1.411	Dec 2017	-		1.411	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VAC FILO - PM/MS S - Program Management/ Program Manager Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	5.993	2.430	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC NGA - PM/MS SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.282	Nov 2017	-		0.282	Continuing	Continuing	0.000
VAC WEVEE - PM/MS S - Program Manager Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.317	1.344	Dec 2015	1.000	Dec 2016	2.000	Dec 2017	-		2.000	Continuing	Continuing	0.000
VAC WEVEE - PM/MS C - Contractor Systems Engineering Program Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	1.432	1.405	Mar 2016	1.317	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - PM/MS S - Joint Vaccine Acquisition Program Management	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.455	0.999	Dec 2015	0.000		0.563	Dec 2017	-		0.563	Continuing	Continuing	0.000
AV TX - Candidate 2 - PM/MS - SB - Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		1.330	Jan 2017	1.365	Jan 2018	-		1.365	Continuing	Continuing	0.000
AV TX - Candidate 2 - PM/MS - SB - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		1.013	Jan 2017	1.742	Jan 2018	-		1.742	Continuing	Continuing	0.000
AV TX - Candidate 2 - PM/MS - SB - Management Support #3	Allot	JPM Medical Countermeasure Systems (JPM	0.000	0.000		0.585	Jan 2017	0.676	Jan 2018	-		0.676	Continuing	Continuing	0.000









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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
VAC WEVEE - VRP - Manufacturing Assay Development	██████████																											
VAC WEVEE - VRP - Manufacturing Process Development and Pilot Lots	████████████████████																											
VAC WEVEE - VRP - Pre-IND									████																			
VAC WEVEE - VRP - IND Submission													████															
VAC WEVEE - VRP - Phase 1 Clinical Trial													████████████████															
VAC WEVEE - Milestone B													████															
AV TX - Pipeline Drug Candidate Screening (pan Toga Virus/pan Filo virus)					████████████████████																							
AV TX - Pilot Animal Efficacy Studies (Marburg/Ebola-Sudan)					████████████████████																							
AV TX - Alphavirus and Filovirus Non-Human Primate Animal Model Enhancement					████████████████████																							
AV TX - Pilot Animal Efficacy Studies (Monoclonal Antibodies)					████████████████████																							
AV TX - IND Enabling Toxicology Studies					████████████████████																							
AV TX - IND and Phase 1 Trial																	████████████████████											

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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**Schedule Details**

Events	Start		End	
	Quarter	Year	Quarter	Year
MCMPT - Develop Standardized Design Capabilities	2	2018	4	2018
BSL4 GLP T&E - BSL-4 GLP T&E - Maintain Bio-Safety Level BSL-4 Test and Evaluation Capability	1	2016	4	2022
CMDR-B - Drug product manufacturing with DHHS/BARDA	3	2016	1	2019
CMDR-B - Cooperative Teaming Agreement (CoTA) DTRA for the efficacy testing of GSK drug for NHP Testing for anthrax and tularemia	3	2016	1	2019
CMDR-B - Milestone B Decision	1	2019	1	2019
CMDR-B - Request for Prototype Proposal for the JPM MCS OTA Consortium	1	2017	4	2020
CMDR-B - Phase 3 Clinical Trials/Expanded Human Safety Testing	1	2019	4	2022
NGDS Increment 2 - TMRR Phase	1	2016	4	2020
NGDS Increment 2 - Man Portable Dx Device TMRR	1	2016	3	2017
NGDS Increment 2 - ChemDx TMRR	3	2016	4	2019
NGDS Increment 2 - RHDD TMRR	3	2016	1	2021
NGDS Increment 2 - Benchtop Immunoassay Target Maturation	1	2018	4	2020
NGDS Increment 2 - Benchtop Dx Instrument Maturation	1	2018	2	2020
VAC FILO - Manufacturing Pilot Scale	1	2016	4	2016
VAC FILO - Assay Development and Qualification Competitive Prototypes	1	2016	4	2016
VAC FILO - Non-clinical efficacy and safety studies	1	2016	3	2019
VAC FILO - Conduct Final Drug Product Formulation	1	2016	1	2017
VAC FILO - Manufacturing process development/assay and formulation development; cGMP Manufacturing	1	2016	3	2018
VAC FILO - Phase 1 Clinical Trials Competitive Prototypes	1	2016	3	2019
VAC FILO - IND Submission (first prototype)	1	2017	1	2017

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MB4 / MEDICAL BIOLOGICAL DEFENSE (ACD&P)
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Events	Start		End	
	Quarter	Year	Quarter	Year
VAC FILO - Second IND Submission	3	2017	3	2017
VAC FILO - Milestone B	1	2020	1	2020
VAC NGA - Non-Clinical Testing	2	2018	1	2019
VAC RIC - Assay Development	1	2016	4	2016
VAC RIC - Animal Model Efficacy Studies	1	2016	4	2016
VAC RIC - Stability Testing	1	2016	4	2018
VAC RIC - Manufacturing Technology Transfer to the ADM Capability	1	2017	4	2018
VAC WEVEE - VLP - Non-Clinical Studies	1	2016	4	2016
VAC WEVEE - VLP - Manufacturing Assay Development	1	2016	4	2016
VAC WEVEE - VLP - Manufacturing Process Development and Pilot Lots	1	2016	2	2016
VAC WEVEE - VLP - IND Submission	2	2017	2	2017
VAC WEVEE - VLP - Phase 1 Clinical Trial	4	2016	2	2019
VAC WEVEE - VRP - Non-Clinical Studies	1	2016	1	2017
VAC WEVEE - VRP - Manufacturing Assay Development	1	2016	3	2016
VAC WEVEE - VRP - Manufacturing Process Development and Pilot Lots	1	2016	4	2017
VAC WEVEE - VRP - Pre-IND	1	2018	1	2018
VAC WEVEE - VRP - IND Submission	4	2018	4	2018
VAC WEVEE - VRP - Phase 1 Clinical Trial	1	2019	4	2019
VAC WEVEE - Milestone B	2	2019	2	2019
AV TX - Pipeline Drug Candidate Screening (pan Toga Virus/pan Filo virus)	1	2017	1	2019
AV TX - Pilot Animal Efficacy Studies (Marburg/Ebola-Sudan)	2	2017	3	2019
AV TX - Alphavirus and Filovirus Non-Human Primate Animal Model Enhancement	1	2017	4	2019
AV TX - Pilot Animal Efficacy Studies (Monoclonal Antibodies)	2	2017	2	2020
AV TX - IND Enabling Toxicology Studies	3	2017	3	2020
AV TX - IND and Phase 1 Trial	3	2020	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)				<b>Project (Number/Name)</b> MC4 / MEDICAL CHEMICAL DEFENSE (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MC4: MEDICAL CHEMICAL DEFENSE (ACD&P)	-	1.060	5.681	5.165	-	5.165	0.990	1.975	1.972	7.098	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project provides for the development of medical materiel and other medical equipment items necessary for the Technology Maturation and Risk Reduction phase of the acquisition life cycle for the advanced development of Medical Countermeasures (MCMs) for chemical warfare agents including diagnostic equipment, prophylactic, pre-treatment, and therapeutic drugs, and individual/casualty decontamination compounds. A family-of-systems approach for medical defense against chemical warfare agents is required to provide protection, to sustain performance in a chemical environment, and to provide for self-aid/buddy-aid and medical treatment of chemical casualties. Fielding of prophylactic, pre-treatment, and therapeutic drugs and medical devices requires Food and Drug Administration (FDA) approval. Given the family-of-systems approach for development of chemical MCMs for the treatment of nerve agent intoxication, multiple long-term studies are required to obtain FDA approval to deliver products that effectively integrate with current and projected therapeutic regimens. Efficacy testing of most candidate drugs against chemical warfare agents cannot be conducted in humans; therefore, animal surrogate models must be developed and employed. The program currently includes: Improved Nerve Agent Treatment System (INATS) an enhanced nerve agent treatment regimen consisting of an improved oxime to replace the current fielded oxime 2-pralidoxime chloride (2-PAM).

The Improved Nerve Agent Treatment System (INATS) advanced development provides an enhanced capability treatment regimen offering greater protection over a broader spectrum of toxic nerve agent threats. Components of the development include (1) a new and improved oxime (replacing 2-pralidoxime chloride (2-PAM)) to provide protection across current and emerging threats, (2) expanded nerve agent indications for a fielded, single indication, pyridostigmine bromide (PB) product, and (3) insertion of a centrally-acting (CA) anticholinergic agent to the treatment regimen to increase survivability and decrease morbidity. The INATS treatment regimen both improves the performance of, and eventually replaces the Antidote Treatment Nerve Agent Auto-injector (ATNAA), while expanding warfighter pretreatment options.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) INATS	0.488	-	0.730
<b>FY 2016 Accomplishments:</b> Continued Chemistry, Manufacturing, and Controls (CMC) manufacturing of trial material.			
<b>FY 2018 Plans:</b> Complete CMC Manufacturing of trial material			
<b>Title:</b> 2) INATS	0.572	-	1.425
<b>FY 2016 Accomplishments:</b>			

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> MC4 / MEDICAL CHEMICAL DEFENSE (ACD&P)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Initiated Rabbit cause of death studies			
<b>FY 2018 Plans:</b> Continue rabbit, rat & NHP cause of death studies			
<b>Title:</b> 3) INATS	-	2.100	1.925
<b>FY 2017 Plans:</b> Initiate OXIME non-clinical studies.			
<b>FY 2018 Plans:</b> Continue & complete OXIME non-clinical studies.			
<b>Title:</b> 4) INATS	-	1.781	1.085
<b>FY 2017 Plans:</b> Initiate OXIME phase 1 clinical trial.			
<b>FY 2018 Plans:</b> Continue and complete OXIME Phase 1 clinical trial.			
<b>Title:</b> 5) INATS	-	1.800	-
<b>FY 2017 Plans:</b> Develop bulk drug substance (BDS) and final drug product (FDP) for non-clinical testing of the oxime.			
<b>Accomplishments/Planned Programs Subtotals</b>			
	1.060	5.681	5.165

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MC5: MEDICAL CHEMICAL DEFENSE (EMD)	64.773	39.504	47.388	-	47.388	62.092	38.576	40.607	31.746	Continuing	Continuing
• JM6677: ADVANCED ANTICONVULSANT SYSTEM (AAS)	0.000	0.000	0.000	-	0.000	0.360	0.360	2.700	2.700	Continuing	Continuing

**Remarks**  
IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> MC4 / <i>MEDICAL CHEMICAL DEFENSE (ACD&amp;P)</i>

The INATS' evolutionary Acquisition Strategy has expanded to (1) align all Department of Defense nerve agent therapeutics under it, and to (2) insert a centrally-acting (CA) anticholinergic agent. This strategy employs an incremental approach to provide independent, and more rapid deliveries of oxime, expanded PB indications, and CA capabilities than in a combined treatment regimen delivery. In the Technology Maturation and Risk Reduction (TM&RR) phase, close collaborations will occur with the science/ technology, and user communities to assess technical viability, capability delivery options, and to refine operational concepts; the Government will be the systems integrator overseeing the conduct of oxime and centrally acting formulation development efforts, nonclinical toxicology and efficacy studies, clinical safety studies, and efficacy studies addressing the PB indication. In the Engineering and Manufacturing Development (EMD) phase for the oxime and CA each capability, the Government will engage with commercial partner(s) to ensure that INATS development and manufacture is in accordance with Food and Drug Administration (FDA) regulations and guidelines; the commercial partner(s) will perform a Phase 2 human clinical safety study, nonclinical toxicology studies and definitive animal efficacy studies; the commercial partner(s) will also oversee the manufacture of improved oxime and CA formulations and delivery system that is stable under operationally relevant temperatures. The Government will submit a New Drug Application and seek FDA approval for the INATS product. In the Production and Deployment (P&D) Phase, the Government will pursue full-rate and stockpile production, conduct any FDA mandated post-marketing surveillance studies, and will transfer contracting/ logistical responsibilities to the Defense Logistics Agency (DLA) while remaining to monitor program performance through disposal as the life-cycle manager.

**E. Performance Metrics**

N/A



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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)				<b>Project (Number/Name)</b> TE4 / TEST & EVALUATION (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TE4: TEST & EVALUATION (ACD&P)	-	11.763	14.887	9.157	-	9.157	6.581	5.170	5.165	3.549	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This funding supports the Chemical Biological Defense Portfolio (CBDP) Test Equipment, Strategy, and Support (TESS) efforts TESS provides test infrastructure products for testing and evaluating chemical and biological defense systems throughout the life cycle acquisition process. TESS test infrastructure products are aligned in three groups to include: (1) Analysis and Requirements; (2) Laboratory; (3) Field.

(1) Analysis and Requirements: The products for this area are the analyses of requirements and justification of needs for test infrastructure to support acquisition efforts (e.g. Programs of Record (PORs), Advanced Technology Demonstrations (ATDs), and Accelerated Acquisition). The result is a verified need for component upgrades to existing test infrastructure, dynamic laboratory upgrades to existing test infrastructure, or initiation of new test infrastructure.

(2) Laboratory: The products for this area are the Non-Traditional Agent Defense Test System (NTADTS) and improvements to the Dynamic Test Chamber (DTC). The NTADTS provides a new capability to conduct chemical defense testing against current and emerging threat agents. The NTADTS supports testing of decontamination, collective protection, individual protection, and contamination avoidance products. The DTC provides a new capability for testing chemical point detection systems against chemical warfare agents in various environmental conditions. The CBD acquisition programs supported are Chemical Biological Radiological Nuclear Dismounted Reconnaissance Sets Kits and Outfits (CBRN DRS), Next Generation Chemical Detector (NGCD), Uniform Integrated Protection Ensemble (UIPE) Increment 2 and Common Analytical Laboratory System (CALs). Future efforts will include the development of test methods and methodologies for additional classes of agents.

(3) Field: The products for this area are Test Grid, Safari Test Grid, Joint Ambient Breeze Tunnel (JABT) and Active Standoff Chamber (ASC). The Test Grid effort provides a fully instrumented grid for chemical and biological simulant field test capabilities that integrate referee systems; dissemination equipment; real-time cloud tracking capability; meteorological equipment; a wireless network; and a Data Management System (DMS) software to track and display the simulant cloud; and provide status of all of the equipment in the network at Dugway Proving Ground (DPG). The Safari Test Grid is an all-inclusive mobile management service functioning wirelessly, capable of integrating, controlling, commanding and managing all assets required to conduct chemical and biological (CB) tests at any Major Range Test Facility Base (MRTFB). It provides algorithms and graphical user interfaces for automating real-time visualization, raw data, computation, hosts data collection and indefinite storage that can go to any MRTFB for CB Testing. The JABT and ASC improvements will provide a tech refresh to existing infrastructure and allow establishment of test data correlation between laboratory-tunnels-field for test results. The CBD acquisition programs supported are the Joint Expeditionary Collective Protection (JECp), Next Generation Chemical Detector (NGCD), Joint Biological Tactical Detection System (JBTDs), and the Joint USFK Point and Integrated Threat Recognition (JUPITR) Advanced Technology Demonstration (ATD).

Experimentation and demonstration will be used to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> TE4 / TEST & EVALUATION (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) PD TESS - Program Management <b>FY 2016 Accomplishments:</b> Continued Government Integrated Product Team, program management, systems engineering and IPT support. <b>FY 2018 Plans:</b> Continue Government Integrated Product Team, program management, systems engineering and IPT support.	2.417	-	3.400
<b>Title:</b> 2) PD TESS - Non-Traditional Agent Defense Test System (NTADTS) <b>FY 2016 Accomplishments:</b> Continued methodology development for additional classes of agent. <b>FY 2017 Plans:</b> Continue methodology development and continue test fixture design for additional classes of agent. <b>FY 2018 Plans:</b> Continue methodology development and continue test fixture design for additional classes of agent.	1.713	6.267	2.756
<b>Title:</b> 3) PD TESS - Joint Ambient Breeze Tunnel (JABT) <b>FY 2016 Accomplishments:</b> Initiated the integration of the JABT into the Test Grid DMS. <b>FY 2017 Plans:</b> Complete implementation of design. Conduct risk reduction testing.	0.173	1.388	-
<b>Title:</b> 4) PD TESS - Active Standoff Chamber (ASC) <b>FY 2016 Accomplishments:</b> Designed the integration of the ASC into the Test Grid DMS.	0.171	-	-
<b>Title:</b> 5) PD TESS - Test Grid <b>FY 2016 Accomplishments:</b> Characterized and integrated biological and chemical and dissemination systems.	4.659	-	-
<b>Title:</b> 6) PD TESS - Dynamic Test Chamber (DTC) <b>FY 2017 Plans:</b> Complete methodology development for upgrades and implement into chamber.	-	1.388	-
<b>Title:</b> 7) PD TESS - Test Infrastructure Analysis & Requirements (TIA&R)	2.130	2.082	2.301

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	<b>Project (Number/Name)</b> TE4 / TEST & EVALUATION (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Initiated analysis to support test infrastructure for new requirements.</p> <p><b><i>FY 2017 Plans:</i></b> Continue to characterize current capabilities for the CBDP to support decisions for new test infrastructure. Continue to analyze upcoming test infrastructure needs and requirements and initiate planning for studies. Analyze supporting Dynamic Test Chamber upgrades, Joint Ambient Breeze Tunnel and Active Standoff Chamber upgrades, and manage the CBDP database for all test capabilities. Initiate requirements development for new test infrastructure such as decontamination test fixtures, mobile test infrastructure, NTA Facility for PORs and acquisition support.</p> <p><b><i>FY 2018 Plans:</i></b> Continue to analyze upcoming test infrastructure needs and requirements.</p>			
<p><b><i>Title:</i></b> 8) PD TESS - Safari Test Grid</p> <p><b><i>FY 2016 Accomplishments:</i></b> Completed the design and created a prototype of the test fixture modifications.</p> <p><b><i>FY 2017 Plans:</i></b> Conduct full end-to-end network requirements analysis. Begin regression testing.</p> <p><b><i>FY 2018 Plans:</i></b> Integrate additional referee instrumentation and transition the capability to DPG.</p>	0.500	3.762	0.700
<b>Accomplishments/Planned Programs Subtotals</b>	11.763	14.887	9.157

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

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2018</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To</b>	
			<b>Base</b>	<b>OCO</b>	<b>Total</b>					<b>Complete</b>	<b>Total Cost</b>
• TE5: TEST & EVALUATION (EMD)	6.021	6.119	9.548	-	9.548	9.056	7.788	7.990	7.394	Continuing	Continuing
• TE7: TEST & EVALUATION (OP SYS DEV)	2.681	2.594	6.605	-	6.605	6.318	5.416	5.733	5.733	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

TEST EQUIPMENT, STRATEGY & SUPPORT (PD TESS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603884BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (ACD&amp;P)</i>	<b>Project (Number/Name)</b> TE4 / <i>TEST &amp; EVALUATION (ACD&amp;P)</i>

TESS efforts are supported through competitive contract actions, academia, and other Government agencies. Infrastructure solutions will leverage commercially available systems to provide state-of-the-art capabilities that address current and future CBDP test and evaluation needs.

**E. Performance Metrics**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	276.560	266.231	406.789	-	406.789	365.017	353.393	294.527	262.443	Continuing	Continuing
CA5: <i>CONTAMINATION AVOIDANCE (EMD)</i>	-	55.468	50.203	127.499	-	127.499	95.222	86.003	39.725	34.712	Continuing	Continuing
CM5: <i>HOMELAND DEFENSE (EMD)</i>	-	6.880	11.224	21.411	-	21.411	0.000	0.000	0.000	0.000	0	39.515
CO5: <i>COLLECTIVE PROTECTION (EMD)</i>	-	7.228	4.224	8.546	-	8.546	10.802	5.333	4.930	0.000	0	41.063
DE5: <i>DECONTAMINATION SYSTEMS (EMD)</i>	-	16.015	9.984	15.686	-	15.686	6.349	12.037	16.527	13.516	Continuing	Continuing
IP5: <i>INDIVIDUAL PROTECTION (EMD)</i>	-	19.720	11.427	14.481	-	14.481	11.600	4.500	3.371	3.370	Continuing	Continuing
IS5: <i>INFORMATION SYSTEMS (EMD)</i>	-	20.043	27.323	25.677	-	25.677	23.159	22.594	21.182	22.814	Continuing	Continuing
MB5: <i>MEDICAL BIOLOGICAL DEFENSE (EMD)</i>	-	80.412	106.223	136.553	-	136.553	170.330	196.813	183.836	160.146	Continuing	Continuing
MC5: <i>MEDICAL CHEMICAL DEFENSE (EMD)</i>	-	64.773	39.504	47.388	-	47.388	38.499	18.325	16.966	20.491	Continuing	Continuing
TE5: <i>TEST &amp; EVALUATION (EMD)</i>	-	6.021	6.119	9.548	-	9.548	9.056	7.788	7.990	7.394	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

Operational forces have an immediate need to survive, safely operate, and sustain operations in a Chemical and Biological (CB) threat environment across the continuum of global, contingency, special operations/low intensity conflict, counternarcotics, and other high-risk missions. Operating forces have a critical need for defense against worldwide proliferation of CB warfare capabilities and for medical treatment of CB casualties. Congress directed centralized management of Department of Defense (DoD) CB Defense initiatives, both medical and non-medical. This program element supports the Engineering and Manufacturing Development (EMD) of medical and physical CB defensive equipment and materiel. Projects within BA5 are structured to consolidate Joint and Service-unique tasks within four commodity areas: contamination avoidance, individual and collective force protection, decontamination, and medical countermeasures. This consolidation provides for development and operational testing of equipment for Joint Service use and for Service-unique requirements.

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**Exhibit R-2, RDT&E Budget Item Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>
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Contamination avoidance efforts under this system development program will provide U.S. forces with real-time hazard assessment capabilities. They include multi-agent point and remote chemical detection for ground, aircraft, and shipboard applications; automated warning and reporting systems; integrated radiation detection and monitoring equipment; and enhanced battlefield reconnaissance capabilities. Force protection efforts will increase protection levels while decreasing physical and psychological burdens imposed by protective equipment.

The Secretary of Defense is responsible for research, development, acquisition, and deployment of medical countermeasure equipment and materiel to prevent or mitigate the health effects of CB threats to the Armed Forces and directs strategic planning for and oversight of programs to support medical countermeasures development and acquisition for our Armed Forces personnel. The CB medical threat to the Armed Forces, in contrast with public health threats to U.S. citizens, encompasses all potential or continuing enemy actions that can render a Service Member combat ineffective. CB medical threats, because they apply as a whole to military units deployed on a specific mission and/or operations, may result in the unit being unable to complete its mission. CB medical countermeasures developed by DoD, unlike those developed to support the U.S. population, must support military commanders practical operational requirements and deployment strategies and must emphasize prevention of injury and illness and protection of the force. Preventive measures in this EMD, such as vaccines and chemical prophylaxis, conserves fighting strength, decreases the logistics burden by reducing the need for larger deployed hospital footprint and greater demand for tactical and strategic medical evacuation, and satisfy the need for greater flexibility in military planning and operations. When vaccines and other prophylactic medical countermeasures are not available, efforts on this EMD support pre-hospitalization treatment, en-route care, hospital care, and long-term clinical outcomes. Specific items in this category include CB diagnostics, and therapeutics to mitigate the consequences of biologic threats and exposure to ionizing radiation due to nuclear or radiological attacks.

The Department of Defense coordinates its efforts with the Departments of Health and Human Services to promote synergy and minimize redundancy. The Department of Defense ensures coordination by participating in the Public Health Emergency Medical Countermeasures Enterprise interagency strategic planning process ("One Portfolio"). The Department of Defense's longstanding experience and success in CB medical countermeasure research, development, acquisition, and deployment not only ensures protection of the Armed Forces, it also accelerates and improves the overall national efforts in CB medical countermeasure research, development, and acquisition because of its unique facilities, testing capabilities, and trained and experienced personnel.

The projects in this program element support efforts in the engineering and manufacturing phase of the acquisition strategy and are therefore correctly placed in Budget Activity 5.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: FY 2018 Chemical and Biological Defense Program</b>	<b>Date: May 2017</b>
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP I <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	282.147	266.231	412.287	-	412.287
Current President's Budget	276.560	266.231	406.789	-	406.789
Total Adjustments	-5.587	0.000	-5.498	-	-5.498
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-5.587	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-5.498	-	-5.498

**Change Summary Explanation**

Funding: FY18 - Adjustments (\$5M) due to fact-of-life changes and to support efforts in advanced development.

Schedule: N/A

Technical: N/A

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**Exhibit R-2A, RDT&E Project Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
CA5: CONTAMINATION AVOIDANCE (EMD)	-	55.468	50.203	127.499	-	127.499	95.222	86.003	39.725	34.712	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project supports Engineering and Manufacturing Development and Low Rate Initial Production (EMD/LRIP) of an array of reconnaissance, detection and identification equipment, and warning systems. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs. Efforts included in this project are: (1) Enhanced Maritime Biological Detection (EMBD); (2) Joint Nuclear Biological Chemical Radiological System (JNBCRS) (3)The Joint Handheld Bio-Agent Identifier (JHBI); (4) Joint Biological Tactical Detection System (JBTD); (5) Next Generation Chemical Detector (NGCD); (6) Non-Traditional Agent (NTA) Defense Support, (7) the Global Biosurveillance Technology Initiatives (GBTI); and (7)

The Enhanced Maritime Biological Detection (EMBD) program as a FY17 new start will transition a technology from the Assessment of Environmental Detection (AED) leg of the Joint USFK Portal and Integrated Threat Recognition (JUPITR) Advanced Technology Demonstration (ATD) to a program of record for the US Navy (USN). The EMBD will address Navy detection and identification capability gaps and replace the 135 Joint Biological Point Detection Systems (JBPD) currently fielded to the Navy. The EMBD system will provide improved detection sensitivity, lower false alarms and a modernized computing architecture. The EMBD program will complete development and testing, integration and production of a lower cost biological point detection system that will detect, collect and identify biological warfare agent aerosols. The EMBD will provide automated warning and provide a reduced sustainment cost while protecting the shipboard personnel.

Joint Nuclear Biological Chemical Radiological System (JNBCRS) is the sensor suite upgrade to the Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV). The NBCRV Sensor Suite (NBCRV SS) is the Mission Equipment Package for the Stryker NBCRV and consists of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a chemical vapor sampling system, point radiological detector, a standoff radiological detector, and a Sensor Processing Group. The NBCRV SS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark, Nuclear Biological Chemical (NBC) Hazards. The NBCRV Sensor Suite Upgrade will improve chemical, biological and nuclear detection and identification capabilities, increase the maneuver speed of the NBCRV when conducting NBC missions, and reduce sustainment costs over the current system.

The Joint Handheld Bio-Agent Identifier (JHBI) program is a Joint Service Acquisition Category (ACAT) III program consisting of two increments to address an existing United States Special Operations Command (USSOCOM) requirement for handheld, multiplexed, environmental, bio-agent identification. The JHBI program was initiated under the Joint Biological Tactical Detection System (JBTD) and will provide three different handheld bio-identification systems for the rapid and accurate identification of organisms at the point of contact for multiple mission types. The proposed JHBI systems will be handheld, Polymerase Chain Reaction-based, multiplexed devices for the analysis of powder or liquid environmental biological samples. JHBI capabilities will provide Special Operations Forces with timely and accurate identification of 8 or more bio-agents at the point of need. JHBI Increment 1 is anticipated to serve as a supplemental capability to the BioFire RAZOR with Increment 2 fielding the complete replacement of the RAZOR by FY20.



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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The Joint Biological Tactical Detection System (JBTDS) program will develop, integrate, test, and produce the first lightweight, low cost biological surveillance system that will detect, collect, and identify biological warfare agent aerosols. JBTDS will provide warning through the Joint Warning And Reporting Network (JWARN) and archive sample for follow-on analyses. JBTDS, providing near real-time local audio and visual alarm, may be employed by any Military User. JBTDS components will be man-portable, battery-operable, and easy to employ. JBTDS will provide notification of a hazard and enhance battle space awareness to protect and preserve the force. When networked, JBTDS will augment existing biological detection systems to provide a theater-wide seamless array capable of biological detection, identification and warning to support time sensitive force protection decisions. The JBTDS will provide lightweight, handheld identifiers specifically designed for environmental identification missions conducted by Special Purpose Units (SPU) for the screening and confirmation of unknown sample in the field. JBTDS will initiate engineering and redesign studies to support the integration of components into Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV).

The Next Generation Chemical Detector (NGCD) is several detection systems for vapor and aerosol monitoring (NGCD 1), location of liquid and solids on surfaces (NGCD 2), and sampling multiple phases of matter (NGCD 3). NGCD will detect and identify non-traditional agents, chemical warfare agents (CWAs), toxic industrial chemicals (TICs) in the air and on surfaces. The NGCD will provide improved NTA/CWA/TIC selectivity and sensitivity on multiple platforms as well as multiple environments. These sensors will improve detection, consequence management and reconnaissance, and weapons of mass destruction (WMD) interdiction capabilities. The scope of the project includes detection of chemical a few feet away from the detector as well as at the sampling point of the detector. Additional tasks will ruggedize and test a system for nontraditional agent detection for special purpose units.

The Non-Traditional Agent (NTA) Defense program supports the on-going chemical and biological (CB) defense efforts as acquisition programs address emerging threat requirements across the full spectrum of commodities. Dedicated initiatives and projects will develop and transition information, technologies, and capabilities into acquisition options and efforts (e.g. Programs of Record, Enhanced Capability Demonstrations, and Accelerated Acquisition) that account for the breadth and depth of advanced, emerging, and unknown CB threats and span the full range of defense missions. The NTA Defense program will provide essential enablers such as threat understanding; operational impacts of performance trades; and comprehensive, integrated, and layered defense concepts against advanced, emerging, and unknown CB threats. The program will support a balanced portfolio which will target capabilities to reduce operational and tactical risk from technology gaps inherent from emerging threats. Additional efforts in conducting systems engineering analysis will occur in order to identify and consolidate capability knowledge gaps and prioritize required investments. These initiatives allow the CBDP to mitigate risk against emerging threats and better prepare the warfighter to deal with technological surprise across the full range of military missions.

The Global Biosurveillance Technology Initiative (GBTI) will research and characterize laboratory networks and develop algorithms to identify key nodes, having the greatest potential to compress the time between disease event initiation and the production of actionable data. Key node data generation will be augmented in direct support of existing programs of record such as the Common Analytical Laboratory System (CALs).

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) EMBD - Government Support	-	2.205	3.620
<b>FY 2017 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Provide Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, and technical support for USN variant. <b>FY 2018 Plans:</b> Continue Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, and technical support for USN variant.				
<b>Title:</b> 2) EMBD - IDP Transition <b>FY 2018 Plans:</b> Initiate detector Technical Data Package (TDP) transition to Industry and government test support.		-	-	2.000
<b>Title:</b> 3) EMBD - Prototype Acquisition <b>FY 2018 Plans:</b> Initiate acquisition of seven prototype systems for contractor developmental testing (DT) and government DT/ Operational Assessment (OA).		-	-	5.958
<b>Title:</b> 4) EMBD - Live Agent Testing <b>FY 2018 Plans:</b> Initiate live agent testing to verify detector performance against remaining agents not tested in JUPITR Advanced Technology Demonstration (ATD).		-	-	2.000
<b>Title:</b> 5) EMBD - IPT Support <b>FY 2017 Plans:</b> Initiate combat developer, test community and Service representation (i.e. integrated product teams (IPT) and working groups) during Engineering and Manufacturing Development (EMD) Phase for USN variant. <b>FY 2018 Plans:</b> Continue combat developer, test community and Service representation (i.e. integrated product teams (IPT) and working groups) during Engineering and Manufacturing Development (EMD) Phase.		-	1.123	0.500
<b>Title:</b> 6) EMBD - LMI <b>FY 2017 Plans:</b> Initiate development of Logistics Management Information (LMI) for USN variant.		-	0.671	-
<b>Title:</b> 7) JHBI <b>FY 2018 Plans:</b>		-	-	0.990

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Conduct and complete Developmental and Operational testing of all three systems. Complete Low Rate Initial Production and Initial Operational Test and Evaluation. Field all three systems at Full Operational Capability with screening and confirmatory assays.				
<b>Title:</b> 8) JNBCRS 1 <b>FY 2018 Plans:</b> Initiate and continue the design, build, test, and integrated logistics task of the Stryker NBCRV Sensor Suite.		-	-	17.952
<b>Title:</b> 9) JBTDS <b>FY 2016 Accomplishments:</b> Continued the EMD Contract - development and delivery of first increment of test articles (including the 17 detector/collectors: \$20,502 each, 18 collectors: \$12,540, 17 identifiers: \$39,708, and 14 base stations: \$28,995 each, consumables consist of the following 117 identifier consumables: \$115 each, and 354 collector consumables: \$25 each). The EMD Contract also includes Program Management, Logistics and Test Support. <b>FY 2017 Plans:</b> Complete the EMD Contract (including 45 test articles at \$70,342 each, 1050 consumables at \$134 each). <b>FY 2018 Plans:</b> Continue the EMD Contract for program management, logistics and test support.		8.675	3.599	0.700
<b>Title:</b> 10) JBTDS <b>FY 2016 Accomplishments:</b> Continued development and design of a tactical common identifier using the identification system down-selected from Next Generation Diagnostic System (NGDS) Increment 1 program. <b>FY 2017 Plans:</b> Continue development and design of a tactical identifier using the BioFire Film Array identification system from NGDS Increment 1 program. <b>FY 2018 Plans:</b> Continue development and design of a tactical identifier using the BioFire Film Array identification system from NGDS Increment 1 program.		6.431	5.300	8.891
<b>Title:</b> 11) JBTDS <b>FY 2016 Accomplishments:</b>		7.735	6.032	8.983

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, testing and evaluation, scheduling, and technical support. <b>FY 2017 Plans:</b> Continue Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, testing and evaluation, scheduling, and technical support. <b>FY 2018 Plans:</b> Continue Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, testing and evaluation, scheduling, and technical support.				
<b>Title:</b> 12) JBTDS <b>FY 2016 Accomplishments:</b> Continued combat developer, test community and Service representation (i.e. integrated product teams (IPT) and working groups) during EMD Phase. <b>FY 2017 Plans:</b> Continue and complete combat developer, test community and Service representation (i.e. IPT and working groups) during EMD Phase. <b>FY 2018 Plans:</b> Continue combat developer, test community and Service representation (i.e. integrated product teams (IPT) and working groups) during EMD Phase.		2.966	2.140	3.016
<b>Title:</b> 13) JBTDS <b>FY 2016 Accomplishments:</b> Continued developmental planning and testing to include live agent, environmental false alarm, shipboard operations, outdoor interferent and military standard testing. <b>FY 2017 Plans:</b> Continue and complete developmental planning and testing to include live agent, environmental false alarm, outdoor interferent and military standard testing. <b>FY 2018 Plans:</b> Complete developmental planning and testing to include live agent, environmental false alarm, and outdoor interferent.		4.299	4.218	1.120
<b>Title:</b> 14) JBTDS <b>FY 2016 Accomplishments:</b>		0.600	-	0.400

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued sensor calibration standards effort for routine maintenance, metrology and calibration capability for detection systems. <b>FY 2018 Plans:</b> Complete sensor calibration standards effort for routine maintenance, metrology and calibration capability for detection systems.				
<b>Title:</b> 15) JBTDS <b>FY 2016 Accomplishments:</b> Initiated reliability growth model for EMD phase testing. <b>FY 2017 Plans:</b> Continue reliability growth model for EMD phase testing. <b>FY 2018 Plans:</b> Continue reliability growth model for EMD phase testing.		0.043	0.075	0.120
<b>Title:</b> 16) JBTDS <b>FY 2016 Accomplishments:</b> Continued the verification and validation of military utility model. <b>FY 2018 Plans:</b> Continue the verification and validation of military utility model.		0.100	-	0.250
<b>Title:</b> 17) JBTDS <b>FY 2016 Accomplishments:</b> Initiated and completed combat developer, test community and Service representation (i.e. integrated product teams (IPT) and working groups) for USN variant.		0.225	-	-
<b>Title:</b> 18) JBTDS <b>FY 2016 Accomplishments:</b> Initiated and completed developmental testing to include live agent, environmental false alarm, shipboard operations, outdoor interferent and military standard testing for USN variant.		0.431	-	-
<b>Title:</b> 19) JBTDS <b>FY 2016 Accomplishments:</b> Provided Government strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, and technical support for USN Variant.		1.444	-	-
<b>Title:</b> 20) JBTDS		-	2.670	0.150

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>FY 2017 Plans:</b> Continue engineering redesign study on the JBTDS system to meet Nuclear Biological Chemical Reconnaissance Vehicle(NBCRV) platform requirements.</p> <p><b>FY 2018 Plans:</b> Conduct and complete evaluation and engineering redesign study on the JBTDS system to meet NBCRV platform requirements.</p>				
<p><b>Title:</b> 21) JBTDS</p> <p><b>FY 2016 Accomplishments:</b> Initiated production of BWAs for live agent aerosol testing.</p> <p><b>FY 2018 Plans:</b> Complete production of BWAs for live agent aerosol testing.</p>		0.814	-	2.600
<p><b>Title:</b> 22) JBTDS</p> <p><b>FY 2018 Plans:</b> Initiate Operational Assessment which includes end users and biological simulants.</p>		-	-	3.350
<p><b>Title:</b> 23) JBTDS</p> <p><b>FY 2016 Accomplishments:</b> Conducted development of three lightweight, handheld bio-identification systems with screening assays to meet the needs of Special Purpose Units (SPUs). Completed Increment 1 Developmental Testing and Operational Assessment.</p>		6.087	-	-
<p><b>Title:</b> 24) JBTDS</p> <p><b>FY 2016 Accomplishments:</b> Conducted Government strategic/tactical planning, Government systems engineering, program management, costing, technology assessment, testing and evaluation, scheduling, and technical support for SPUs.</p>		0.334	-	-
<p><b>Title:</b> 25) Next Generation Chemical Detector (NGCD)</p> <p><b>FY 2017 Plans:</b> Award a minimum of three EMD contracts. (including 20 NGCD 3 systems at \$150K each, 20 NGCD 2 systems at \$50K each and 37 NGCD 1 systems at \$15K each).</p> <p><b>FY 2018 Plans:</b> Complete testing of ruggedized sensors</p>		-	13.132	1.200
<p><b>Title:</b> 26) Next Generation Chemical Detector (NGCD)</p>		1.599	3.695	18.045

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>FY 2016 Accomplishments:</b> Continued Government Program Management and system engineering support.</p> <p><b>FY 2017 Plans:</b> Continue Government Program Management. Finalize and conduct milestone B for NGCD 1, NGCD 2, and NGCD 3. Initiate EMD.</p> <p><b>FY 2018 Plans:</b> Continue Government Program Management (transition NGCD 1-3 from BA4 to BA5). Finalize and conduct MSB for NGCD 2 and 3. Initiate EMD.</p>				
<p><b>Title:</b> 27) NGCD</p> <p><b>Description:</b> Chemical Reconnaissance &amp; Explosive Screening Set(CRESS) Engineering Studies</p> <p><b>FY 2016 Accomplishments:</b> Conducted engineering studies.</p>		0.705	-	-
<p><b>Title:</b> 28) NGCD</p> <p><b>Description:</b> NGCD 1 EMD Contract</p> <p><b>FY 2018 Plans:</b> Implement Detailed Design, conduct Critical Design Review (CDR), buy 75 test articles for Production Qualification Test (PQT). Continue EMD.</p>		-	-	11.274
<p><b>Title:</b> 29) NGCD</p> <p><b>Description:</b> NGCD 2- EMD Contract</p> <p><b>FY 2018 Plans:</b> Initiate EMD. Conduct Preliminary Design Review (PDR), buy 5 test articles at 85K each for customer test.</p>		-	-	11.236
<p><b>Title:</b> 30) NGCD</p> <p><b>Description:</b> NGCD 3- EMD Contract</p> <p><b>FY 2018 Plans:</b> Initiate EMD. Conduct Preliminary Design Review (PDR), buy 5 test articles at 150K each for customer test.</p>		-	-	9.835
<p><b>Title:</b> 31) NGCD</p>		-	-	4.847

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Description:</b> NGCD 1 - Test  <b>FY 2018 Plans:</b> Begin Production Qualification Test (PQT). Testing includes PQT Chamber testing and PQT Survivability / Interoperability/ Environmental testing.				
<b>Title:</b> 32) NGCD <b>Description:</b> NGCD 2 - Test  <b>FY 2018 Plans:</b> Conduct customer test for threat library verification.		-	-	0.750
<b>Title:</b> 33) NGCD <b>Description:</b> NGCD 3- Test  <b>FY 2018 Plans:</b> Conduct customer test for threat library verification.		-	-	0.800
<b>Title:</b> 34) NTA Defense - Threat Understanding/Military Utility and Supportability <b>FY 2016 Accomplishments:</b> Initiated planning for expanded threat space characterization. Continued analysis of threat understanding for further emerging classes, Non-traditional agents, to enable refinement of technology and capability gaps identified during mission analysis. Utilized mission analysis outputs to develop initial Military Assessments (MUAs) and Table Top Exercises (TTXs) that inform requirement development.		1.553	-	-
<b>Title:</b> 35) NTA Defense - Systems Engineering <b>FY 2016 Accomplishments:</b> Executed mission modeling to identify enterprise (multi-commodity) NTA solutions to support accelerated and enduring material solution development. Completed initial Integration Portfolio Analytics (IPA) tool development.		2.285	-	-
<b>Title:</b> 36) NTA Defense - Test and Evaluation <b>FY 2016 Accomplishments:</b>		5.106	1.174	1.188



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Utilized emerging threat test bed for system/component technology evaluation against emerging and unforeseen threats, prepared data inputs into Systems Engineering processes that conduct solution set, specifically in detection and IP, analyses. Procured equipment use for technical/operational assessments with user groups.  <b>FY 2017 Plans:</b> Continue to utilize advanced and emerging CB threat test bed facilities and methodologies to evaluate new and emerging component technologies for the enterprise to inform and refine technology development strategies. Initiate planning for MUAs and TTXs to inform lab and field trials evaluating new and emerging component technologies.  <b>FY 2018 Plans:</b> Continue to utilize advance and emerging threat test bed facilities and methodologies to evaluate new and emerging component technologies for the enterprise to inform and refine technology development strategies. Initiate planning for the MUAs and TTXs to inform lab and field trials evaluating new and emerging component technologies. Continue to prioritize efforts to address Advanced Threat requirements for existing programs of record and user groups. Conduct characterization of protective equipment across many classes of threat compounds, to determine ability to meet program requirements. Continued engagement of user groups with Advanced Threat requirements through TTXs and field trials.				
<b>Title:</b> 37) NTA Defense - Strategic Coordination  <b>FY 2016 Accomplishments:</b> Continued to synchronize acquisition strategies across interagency and international NTA initiatives according to DoD/CBDP guidance. Continued to update and maintain NTA Library.		1.132	-	-
<b>Title:</b> 38) Global Biosurveillance Technology Initiative (GBTI)  <b>FY 2016 Accomplishments:</b> Continued ongoing efforts to procure additional assays for biological warfare agents and emerging infectious diseases to support the GBTI labs.  <b>FY 2017 Plans:</b> Complete initial efforts to optimize and procure additional assays for biological warfare agents and emerging infectious diseases to support the GBTI labs for demonstration and method validation purposes at GBTI stakeholder labs. These activities leverage the efforts of other partner OGAs to include DTRA JSTO and CDC to ensure that all aspects of the CBD portfolio are captured. These assays, now multi-plexed, allow lab staff to test one sample against many targets, compresses discovery to decision timeline for decision makers, and, for the first time, put advanced characterization and genomic sequencing tools in labs at or near the sample collection site, as opposed to relying solely on reach back support in the United States.  <b>FY 2018 Plans:</b>		1.277	0.834	1.685

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Complete network analysis to document sample and data flows, identify areas of synergy, and prioritize projects between the GBTI office and the GBTI stakeholder labs. The results of the network analysis will be used to determine the best methods for integrating data and information streams among the labs in order to create a robust data pipeline that feeds the identification of unknown threats, evaluation of countermeasures, and the development of new countermeasures.			
<p><b>Title:</b> 39) GBTI</p> <p><b>FY 2016 Accomplishments:</b> Continued ongoing efforts for bioinformatics integration for Global Biosurveillance Technology Initiative (GBTI).</p> <p><b>FY 2017 Plans:</b> Completed initial efforts for bioinformatics integration and demonstration for Global Biosurveillance Technology Initiative (GBTI). The Bioinformatics effort, in conjunction with whole genomic sequencing, provides a robust and unique capability to the Warfighter, especially is OCONUS and geographically disparate areas. The next generation sequencing provides for a screening capability for pathogens for which there are no assays, provides a mechanism to determine when pathogens are no longer detected by assays, and provides analytical tools that are rapidly changing with regard to analysis capabilities. The utilization of whole genomic sequencing will assist in determining existing network limitations and capabilities for data sharing.</p> <p><b>FY 2018 Plans:</b> Engage with stakeholder laboratories to track projects of mutual interest with the Chemical Biological Defense Program. Projects will cover a variety of activities and will provide data and information used to facilitate the identification of unknown threats and the development of new countermeasures. Will transition S3S and EDGE from DTRA-JSTO to support the engagement with stakeholder laboratories for the generation of data and information that support countermeasure development.</p>	0.688	0.667	2.754
<p><b>Title:</b> 40) GBTI</p> <p><b>FY 2016 Accomplishments:</b> Continued ongoing efforts for three open architecture analytical platforms to be fielded and technology insertion of additional capabilities in support the GBTI labs.</p> <p><b>FY 2017 Plans:</b> Complete initial efforts for three open architecture analytical platforms for sustainment and demonstration of standardized equipment suite and procedures in support the GBTI labs. Operational assessment projects are the GBTI laboratories include metagenomic pathogen discovery, evaluation of GBTI optimized multi-plex assay panels, and high throughput surveillance projects with potential for regional or global impact within context of local health issues. The information gleaned from the operational assessments will assess the baseline of each laboratory, identify and address the gaps, and determining the impact of standardized equipment and operating procedures between laboratories. The Warfighter has a well-trained laboratory staff at 25</p>	0.939	2.668	1.285

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
locations worldwide that can assist in conducting high throughput sample assessments and providing vital information to decision makers in a more concise timeframe, than previously when CONUS reachback support was required.			
<b>FY 2018 Plans:</b> Complete identification, test, and evaluation of new technologies with potential expeditionary analytical applications and their interoperability with existing systems as well as other new technologies.			
<b>Accomplishments/Planned Programs Subtotals</b>	55.468	50.203	127.499

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• CA4: CONTAMINATION AVOIDANCE (ACD&P)	74.684	42.308	29.211	-	29.211	33.181	27.908	20.208	14.131	Continuing	Continuing
• JF0100: JOINT CHEMICAL AGENT DETECTOR (JCAD)	27.134	7.547	4.253	-	4.253	3.500	0.000	0.000	0.000	0	42.434
• JF0104: NEXT GEN CHEMICAL DETECTOR (NGCD)	0.000	2.378	0.000	-	0.000	1.722	15.872	61.516	86.432	Continuing	Continuing
• MC0100: JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)	12.900	1.956	0.500	-	0.500	0.000	0.000	0.000	7.655	Continuing	Continuing
• MC0101: CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)	111.248	90.094	94.424	-	94.424	93.269	59.358	45.924	55.062	Continuing	Continuing
• MX0001: JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)	0.000	0.000	0.000	-	0.000	0.000	46.724	68.825	75.502	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

ENHANCED MARITIME BIOLOGICAL DETECTION (EMBD)

The Enhanced Maritime Biological Detection (EMBD) program will use a streamlined acquisition strategy. This approach is based on the mature technology that will transition from the Assessment of Environmental Detection (AED) leg of the Joint USFK Portal and Integrated Threat Recognition (JUPITR) Advanced Technology Demonstration (ATD) to a program of record for the US Navy. The EMBD program is expected to transition to a pre-MS C upon selection from AED and will make

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> <i>CA5 / CONTAMINATION AVOIDANCE (EMD)</i>
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maximum use of the testing that has been done to field the replacement for the 135 Joint Biological Point Detection Systems (JBPDS) in the Navy. An RFP will be released in FY17 for a competitive procurement.

**JOINT HANDHELD BIO-AGENT IDENTIFIER (JHBI)**

The JHBI program will pursue a collaborative accelerated acquisition strategy to incrementally deliver capability to USSOCOM. JHBI will use commercial items to procure candidate systems from 3 vendors for further development and fielding. JHBI Increment 1 is co-managed and co-executed through an acquisition partnership between the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD) and USSOCOM to expand the relationship between JPEO-CBD and USSOCOM and to leverage acquisition and subject matter expertise on both sides to reduce acquisition timelines and improve customer satisfaction. Specifically, JHBI is using the USSOCOM requirement validation and test and evaluation resources from program inception through Milestone C. The JHBI program acquired test-articles of a single commercial-off-the-shelf (COTS) platform with relevant assays for the JHBI Combat Evaluation (CV), which served as the decision gate for the completion of the Technology Maturation and Risk Reduction (TMRR) phase. To mitigate risk, additional technologies were identified and inserted into JHBI Increment 1 during the TMRR phase.

**JOINT NBC RECONNAISSANCE SYSTEM - STRYKER (JNBCRS)**

The Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRV SS) Upgrade is a single-step in the evolutionary acquisition strategy for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle. The contract approach to integrate of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a chemical vapor sampling system, point radiological detector, a standoff radiological, and a Sensor Processing Group is to utilize competitive contracting. The contract approach for the upgrade of the Sensor Processing group is to use Armament Research Development and Engineering Center (ARDEC).

**JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)**

The JBTDS program will use an evolutionary acquisition strategy. Under this approach, capability is developed based on current technologies, recognizing up front the need for potential technology insertion as technology advances to provide better and more cost effective capabilities. Technology insertions will provide militarily useful and supportable operational capabilities that can be developed, produced, deployed, and sustained. JBTDS will make maximum use of commercial off-the-shelf (COTS) and Government off-the-shelf (GOTS) technology. The JBTDS program is coordinating with Common Analytical Laboratory System and Next Generation Diagnostic System (NGDS) to share information and leverage potential common identification technology solutions. JBTDS utilized NGDS contract vehicle to research and develop a JBTDS tactical variant identifier. Identifier testing will take place during EMD to evaluate technologies against requirements and find the best solution(s) for the warfighter. Full and open competition was utilized at MS B for the Engineering and Manufacturing Development (EMD) contract with options for Low Rate Initial Production and Full Rate Production. Chemring Detection Systems was awarded the EMD contract on 2 April 2015. The JBTDS will address legacy SPU requirements gaps/deficiencies where they exist through the streamlined development and optimization of COTS/GOTS systems; awarded 3 sole-source contracts in July 2015 under the National Security exemption to full and open competition.

**NEXT GENERATION CHEMICAL DETECTOR (NGCD)**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> <i>CA5 / CONTAMINATION AVOIDANCE (EMD)</i>

System Engineering and market survey results suggested the most effective way to develop NGCD was to divide the program into four unique capabilities to detect and identify the full spectrum of chemical compounds in all phases of matter. There are four capability areas, of which three; NGCD 1, NGCD 2 and NGCD 3 were awarded contracts in the Technical Maturation and Risk Reduction Phase. The fourth capability - personal chemical detection is still in technology development. The Government awarded ten (10) contracts in June 2014 to support Technology Maturation Risk Reduction (TMRR) acquisition phase activities in three of the four capability areas: three (3) contracts for the NGCD 1 capability, four (4) contracts for the NGCD 2 capability, and three (3) contracts for the NGCD 3 capability; only 9 are still under contract. Full and Open competition will be used to award at MS B Engineering and Manufacturing Development (EMD) contracts with production options for each capability.

**NON TRADITIONAL AGENT DEFENSE (NTA DEFENSE)**

The Non-Traditional Agent (NTA) Defense program supports the Chemical Biological Defense Program (CBDP) to develop countermeasures for all emerging threats across all commodities. The NTA Defense program consists of a number of projects and initiatives through various types of contract actions (full and open competition, task order/modifications, DLA) that enhance the CBDP's portfolio and mission and feed directly into Programs of Record, Enhanced Capability Demonstrations, and Acquisition Programs. NTA Defense efforts: (1) evaluate COTS and GOTS technologies and systems, (2) conduct demonstrations and experiments, (3) integrate Intelligence Community threat analysis, operational risk analysis with systems technical performance to identify technologies or systems that can be rapidly developed, and deployed, and/or transitioned to an Acquisition Program for technology insertion or derive an Engineering Change Proposal (ECP) to a fielded system, and (4) provide coordination of DoD, interagency, international NTA projects.

**GLOBAL BIO TECH INITIATIVE (GBTI)**

The Global Biosurveillance Technology Initiative (GBTI) strategy establishes a robust data stream that directly supports existing programs of record in their development of biological defense countermeasures through the characterization of laboratory networks and augmentation of key nodes within those networks. This will be accomplished through the use of two University of Affiliated Research Centers (Penn State University and Johns Hopkins University) to characterize laboratory networks and develop decision-making tools for evaluating potential augmentation of key nodes prior to investment (respectively).

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMBD - HW C - Detector	MIPR	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.000	0.000		0.000		2.000	Jan 2018	-		2.000	Continuing	Continuing	0.000
EMBD - HW S - Prototype Development and Manufacturing	MIPR	TBD : TBD	0.000	0.000		0.000		5.958	Mar 2018	-		5.958	Continuing	Continuing	0.000
JNBCRS 1 - HW - Sensor Processing Group Development	MIPR	Armament Research : Development and Engineering Center, Piccatinny, NJ	0.000	0.000		0.000		1.200	Feb 2018	-		1.200	Continuing	Continuing	0.000
JNBCRS 1 - HW-Sensor Suite Development	C/CPIF	Various : Various	0.000	0.000		0.000		13.301	Dec 2017	-		13.301	Continuing	Continuing	0.000
JBTDS - HW S - EMD Contract Award	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	5.937	7.675	Nov 2015	3.599	Nov 2016	0.700	Dec 2017	-		0.700	Continuing	Continuing	0.000
JBTDS - HW C - Tactical Common Identifier	C/CPFF	BioFire Dx : Salt Lake City, UT	7.118	6.431	Mar 2016	5.300	Nov 2016	8.891	Mar 2018	-		8.891	Continuing	Continuing	0.000
JBTDS - HW C - NBCRV Platform Integration	MIPR	TBD : TBD	0.000	0.000		2.670	Mar 2017	0.150	Dec 2017	-		0.150	Continuing	Continuing	0.000
JBTDS - HW C - SPU	SS/FFP	Biomeme : Philadelphia, PA	1.660	2.389	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - HW C - SPU Genedrive	SS/FFP	Epistem : Manchester, UK	2.533	1.702	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - HW C - SPU Mobile Analysis Platform (MAP)	SS/CPFF	Ibis : Carlsbad, CA	1.995	1.996	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype Build	C/CPIF	Smiths Detection : Edgewood, MD	0.453	0.000		13.132	Dec 2016	1.200	Dec 2017	-		1.200	Continuing	Continuing	0.000
NGCD - HW S - NGCD 1	C/CPIF	TBD : TBD	0.000	0.000		0.000		11.274	Nov 2017	-		11.274	Continuing	Continuing	0.000
NGCD - HW S - NGCD 2	C/CPIF	TBD : TBD	0.000	0.000		0.000		11.236	Jan 2018	-		11.236	Continuing	Continuing	0.000
NGCD - HW S - NGCD 3	C/CPIF	TBD : TBD	0.000	0.000		0.000		9.835	Dec 2017	-		9.835	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
NTA DEFENSE - HW S - Systems Engineering	C/CPFF	Various : Various	0.000	1.905	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Strategic Coordination	MIPR	Various : Various	1.314	1.091	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Fielded Equipment Characterization	MIPR	Various : Various	0.002	0.000		0.645	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
GBTI - HW S - GBTI - CRP Assay Optimization	MIPR	Battelle Memorial Institute : Columbus, OH	0.000	1.277	Dec 2015	1.000	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			21.012	24.466		26.346		65.745		-		65.745	-	-	0.000

<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
EMBD - ES S - OTA/OGA Service Representation USN Variant	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.000		1.123	Mar 2017	0.500	Jan 2018	-		0.500	Continuing	Continuing	0.000
EMBD - ILS S - OTA/OGA Service Representation USN Variant	MIPR	Various : Various	0.000	0.000		0.671	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
JHBI - ES S - Engineering and IPT Support	MIPR	Various : Various	0.000	0.000		0.000		0.490	Nov 2017	-		0.490	Continuing	Continuing	0.000
JNBCRS 1 - ES - Engineering Support	MIPR	Various : Various	0.000	0.000		0.000		0.748	Nov 2017	-		0.748	Continuing	Continuing	0.000
JBTDS - ES C - Engineering Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	2.000		0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JBTDS - ES S - OTA/OGA Service Representation	MIPR	Various : Various	3.073	2.966	Mar 2016	2.140	Mar 2017	3.016	Mar 2018	-		3.016	Continuing	Continuing	0.000
JBTDS - ES S - Biosensor Calibration Effort	MIPR	Naval Research Lab (NRL) : Washington, DC	1.675	0.600	Mar 2016	0.000		0.400	Mar 2018	-		0.400	Continuing	Continuing	0.000
JBTDS - ILS S - Reliability Growth Model	MIPR	United States Army Materiel Systems Analysis Activity(AMSAA) : Aberdeen Proving Ground, MD	0.000	0.043	Mar 2016	0.075	Mar 2017	0.120	Mar 2018	-		0.120	Continuing	Continuing	0.000
JBTDS - ES S - OTA/OGA Representation USN Variant	MIPR	Various : Various	0.000	0.225	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - ES S - Joint Service T&E/SE IPT	MIPR	Various : Various	0.000	0.705	Oct 2015	0.000		3.010	Oct 2017	-		3.010	Continuing	Continuing	0.000
NTA DEFENSE - ES C - Support	C/CPFF	Various : Various	0.000	0.235	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - ES S - Analysis and Evaluation	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.183	0.058	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - TD/D C - Integrated Product Team (IPT) Support	MIPR	Various : Various	2.008	0.000		0.124	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			6.939	6.832		4.133		8.284		-		8.284	-	-	0.000



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMBD - DTE C - Live Agent Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		2.000	Jul 2018	-		2.000	Continuing	Continuing	0.000
JHBI - DTE S - Test and Evaluation Support	MIPR	Various : Various	0.000	0.000		0.000		0.500	Nov 2017	-		0.500	Continuing	Continuing	0.000
JNBCRS 1 - DTE - Test and Evaluation	MIPR	Various : Various	0.000	0.000		0.000		0.700	Jul 2018	-		0.700	Continuing	Continuing	0.000
JBTDS - DTE S - Developmental Testing	MIPR	Various : Various	0.499	0.766	Mar 2016	4.218	Mar 2017	0.720	Mar 2018	-		0.720	Continuing	Continuing	0.000
JBTDS - DTE S - V&V of JBTDS Military Utility Model	FFRDC	Institute for Defense Analysis (IDA) : Alexandria, VA	0.464	0.100	Dec 2015	0.000		0.250	Dec 2017	-		0.250	Continuing	Continuing	0.000
JBTDS - DTE S - Development Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.089	Mar 2016	0.000		0.400	Mar 2018	-		0.400	Continuing	Continuing	0.000
JBTDS - DTE S - Dynamic Aerosol Generation System	MIPR	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	0.444	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE S - Battelle	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.814	Mar 2016	0.000		2.600	Mar 2018	-		2.600	Continuing	Continuing	0.000
JBTDS - DTE S - Various	MIPR	Various : Various	0.000	0.000		0.000		3.350	Dec 2017	-		3.350	Continuing	Continuing	0.000
JBTDS - DTE S - Development Testing USN Variant	MIPR	Various : Various	0.000	0.431	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - NGCD 1 - PQT Chamber Test	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		3.200	Dec 2017	-		3.200	Continuing	Continuing	0.000
NGCD - NGCD 1 - PQT Survivability /	MIPR	Various : Various	0.000	0.000		0.000		1.647	Dec 2017	-		1.647	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability/ Environmental															
NGCD - NGCD 2- Customer Testing	MIPR	Various : Various	0.000	0.000		0.000		0.750	Jun 2018	-		0.750	Continuing	Continuing	0.000
NGCD - NGCD 3 - Customer Testing	MIPR	Various : Various	0.000	0.000		0.000		0.800	Mar 2018	-		0.800	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Equipment	MIPR	Defense Logistics Agency : Philadelphia, PA	0.000	3.653	May 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Developmental Test and Evaluation	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.000		0.174	Jan 2018	-		0.174	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Developmental Test and Evaluation #2	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.728	0.059	Mar 2016	0.000		0.436	Mar 2018	-		0.436	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Developmental Test and Evaluation #3	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.280	0.000		0.300	Dec 2016	0.261	Jan 2018	-		0.261	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Analysis and Evaluation	FFRDC	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	1.545	1.750	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
GBTI - Test and Evaluation of Technology Refresh Candidates	MIPR	Various : Various	0.000	0.000		0.000		1.285	Dec 2017	-		1.285	Continuing	Continuing	0.000
<b>Subtotal</b>			4.516	8.106		4.518		19.073		-		19.073	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EMBD - PM/MS S - PM/ System Engineering Support USN Variant	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		2.205	Dec 2016	3.620	Dec 2017	-		3.620	Continuing	Continuing	0.000
JNBCRS 1 - PM - Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.000		2.003	Nov 2017	-		2.003	Continuing	Continuing	0.000
JBTDS - PM/MS SB - Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	12.719	9.735	Dec 2015	6.032	Dec 2016	8.983	Dec 2017	-		8.983	Continuing	Continuing	0.000
JBTDS - PM/MS C - Program Management and System Engineering Support USN Variant	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	1.444	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - PM/MS SB - Program Management and System Engineering Support SPU	MIPR	Various : Various	0.404	0.334	Feb 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - PM/MS C - Program Management and Systems Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	1.625	1.599	Dec 2015	3.695	Dec 2016	15.035	Dec 2017	-		15.035	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA 5 / CONTAMINATION AVOIDANCE (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NTA DEFENSE - PM/MS S - Program Management Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	4.358	1.325	Mar 2016	0.105	Dec 2016	0.317	Dec 2017	-		0.317	Continuing	Continuing	0.000
GBTI - PM/MS C - GBTI - Laboratory Operational Demonstrations	MIPR	Various : Various	0.000	0.939	Dec 2015	2.369	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
GBTI - PM/MS S - GBTI - Network Analysis and Characterization	MIPR	Various : Various	0.000	0.000		0.000		1.685	Jun 2018	-		1.685	Continuing	Continuing	0.000
GBTI - PM/MS C - GBTI - Project Engagement	MIPR	Various : Various	0.000	0.000		0.000		2.754	Nov 2017	-		2.754	Continuing	Continuing	0.000
GBTI - PM/MS C - Bioinformatics	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.688	Jan 2016	0.800	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			19.106	16.064		15.206		34.397		-		34.397	-	-	0.000
<b>Project Cost Totals</b>			51.573	55.468		50.203		127.499		-		127.499	-	-	-

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EMBD - JUPITR Live Agent Testing	■	■																										
EMBD - DRAFT CPD			■	■																								
EMBD - COA Decision Point				■	■																							
EMBD - LMI Development					■	■	■	■	■	■																		
EMBD - Contract Award						■	■																					
EMBD - TEMP						■	■																					
EMBD - Operational Assessment						■	■	■	■																			
EMBD - MS C									■	■																		
EMBD - IOT&E									■	■	■	■																
EMBD - Contract Option Award													■	■														
EMBD - FRP Decision													■	■														
JHBI - Full Operational Capability												■	■	■														
JHBI - Low Rate Initial Production												■	■															
JHBI - MS C												■	■															
JHBI - Initial Operational Test & Evaluation												■	■	■														
JHBI - Operational Testing												■	■	■	■													
JHBI - Developmental Testing												■	■	■	■	■												
JNBCRS 1 - Milestone B														■	■													
JNBCRS 1 - Milestone C																										■	■	
JNBCRS 1 - NBCRV Sensor Suite Development														■	■	■	■	■										
JNBCRS 1 - Vehicle Integration																	■	■	■	■								
JNBCRS 1 - Production Qualification Test																											■	
JNBCRS 1 - Operational Assessment																											■	
JBTDS - CDR																											■	



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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NTA DEFENSE - Systems Engineering																												
NTA DEFENSE - Test and Evaluation																												
NTA DEFENSE - Strategic Coordination (NTA Library)																												
GBTI - Assays and reagents																												
GBTI - Training/On-Site Support																												
GBTI - Sustainment																												
GBTI - Integration with Web-Based Enterprise Environments																												
GBTI - Evaluate Transition Options																												
GBTI - Complete Full System Assessment																												

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**Exhibit R-4A, RDT&E Schedule Details: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMBD - JUPITR Live Agent Testing	1	2016	2	2016
EMBD - DRAFT CPD	3	2016	3	2016
EMBD - COA Decision Point	4	2016	4	2016
EMBD - LMI Development	1	2017	1	2018
EMBD - Contract Award	2	2017	2	2017
EMBD - TEMP	2	2017	2	2017
EMBD - Operational Assessment	3	2017	4	2017
EMBD - MS C	2	2018	2	2018
EMBD - IOT&E	3	2018	1	2019
EMBD - Contract Option Award	2	2019	2	2019
EMBD - FRP Decision	2	2019	2	2019
JHBI - Full Operational Capability	3	2018	4	2018
JHBI - Low Rate Initial Production	2	2018	2	2018
JHBI - MS C	2	2018	2	2018
JHBI - Initial Operational Test & Evaluation	2	2018	3	2018
JHBI - Operational Testing	1	2018	1	2019
JHBI - Developmental Testing	1	2018	3	2019
JNBCRS 1 - Milestone B	1	2019	1	2019
JNBCRS 1 - Milestone C	2	2022	2	2022
JNBCRS 1 - NBCRV Sensor Suite Development	2	2018	2	2020
JNBCRS 1 - Vehicle Integration	2	2020	4	2020
JNBCRS 1 - Production Qualification Test	3	2020	4	2021



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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
JNBCRS 1 - Operational Assessment	4	2021	4	2021
JBTDS - CDR	2	2017	2	2017
JBTDS - DT	1	2016	2	2018
JBTDS - Operational Assessment	3	2018	3	2018
JBTDS - Capability Production Document	2	2018	1	2019
JBTDS - Milestone C	2	2019	2	2019
JBTDS - PVT	1	2021	2	2021
JBTDS - OT	4	2017	2	2018
JBTDS - FRP Decision	3	2021	3	2021
JBTDS - IOC	4	2021	4	2021
NGCD - Acceleration	1	2016	4	2018
NGCD - NGCD (1-3) TMRR	1	2016	3	2017
NGCD - NGCD 1 - Milestone B	4	2017	4	2017
NGCD - NGCD 1 - EMD Contract	1	2019	2	2020
NGCD - NGCD 1 - Milestone C	2	2020	2	2020
NGCD - NGCD 1 - LRIP	2	2020	4	2021
NGCD - NGCD 1 - FRP Decision	4	2021	4	2021
NGCD - NGCD 2 - Milestone B	3	2018	3	2018
NGCD - NGCD 2 - EMD Contract	3	2018	4	2020
NGCD - NGCD 2 - Milestone C	1	2021	1	2021
NGCD - NGCD 2 - LRIP	2	2021	4	2022
NGCD - NGCD 3 - Milestone B	2	2018	2	2018
NGCD - NGCD 3 - EMD Contract	2	2018	3	2020
NGCD - NGCD 3 - Milestone C	3	2020	3	2020
NGCD - NGCD 3 - LRIP	3	2020	3	2022

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CA5 / CONTAMINATION AVOIDANCE (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
NGCD - NGCD 3 - FRP	3	2022	3	2022
NTA DEFENSE - Threat Understanding	1	2016	2	2016
NTA DEFENSE - Systems Engineering	1	2016	4	2016
NTA DEFENSE - Test and Evaluation	1	2016	4	2022
NTA DEFENSE - Strategic Coordination (NTA Library)	1	2016	4	2016
GBTI - Assays and reagents	1	2016	3	2017
GBTI - Training/On-Site Support	1	2016	4	2018
GBTI - Sustainment	1	2016	4	2019
GBTI - Integration with Web-Based Enterprise Environments	1	2016	4	2017
GBTI - Evaluate Transition Options	1	2019	2	2019
GBTI - Complete Full System Assessment	1	2019	1	2019

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
CM5: HOMELAND DEFENSE (EMD)	-	6.880	11.224	21.411	-	21.411	0.000	0.000	0.000	0.000	0	39.515
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Project supports Engineering and Manufacturing Development of the following program: The Common Analytical Laboratory System capability (CALs) will be modular, scalable and adaptable to a variety of concept of operations (CONOPS) and environmental conditions. Currently, fielded systems have been designed and fielded independently by the services with the intent of meeting a specific unit requirement. As a result, multiple mobile lab configurations exist with differing sustainment tails and lacking in commonality. The CALs will provide common analytical capabilities packaged to meet the specific CONOPS and mission of the gaining unit. The analytical capabilities will detect and identify Chemical Warfare Agents (CWAs), Toxic Industrial Chemicals (TICs), Toxic Industrial Materials (TIMs) and Biological Warfare Agents (BWAs). Users of the system will include the National Guard Bureau Civil Support Teams, the Army 20th Support Command, the Army Medical Laboratory, the Air Force, the Marine Corps, and the Navy.

There will be three variants of CALs as detailed below:

1. Field Confirmatory Integrated System (FC-IS) Variant - NGB and Marine Corp User  
-Integrates CBR systems into a common make / model 20-foot International Standard Organization (ISO) container. The container will be integrated onto the International Durastar vehicle to support employment.
2. Theater Validation Integrated System (TV-IS) Variant - Army User  
-Similar to the FC-IS but provides a higher level of confidence in analytical results through the use of orthogonal (complimentary) technologies and an expanded analytical suite. This system employs multiple standardized ISO containers, which will be integrated onto one Family of Medium Tactical Vehicles (FMTV) and one trailer, to support the needed additional laboratory space.
3. Field Confirmatory Analytical Capability Sets (FC-ACS) Variant - Army, Navy, Air Force and NGB User - A palletized / transportable equipment subsets that allows them to be loaded into transport cases and palletized. Enables the users to receive the Chemical and Biological (CB) subsystems that meet their specific mission profiles.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) CALS - Subsystem Component Test and Evaluation	2.930	-	-

**FY 2016 Accomplishments:**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Completed EMD sub-system DT/OT in preparation for Milestone C.				
<b>Title:</b> 2) CALS - System Level Prototype Variant Development and Manufacturing <b>FY 2017 Plans:</b> Continue engineering changes and refurbishment of variant prototypes ensuring integration and connectivity between modules as a general system layout. <b>FY 2018 Plans:</b> Continue engineering changes and refurbishment of variant prototypes ensuring integration and connectivity between modules as a general system layout. Major system design changes are required during the EMD phase for the FC IS and TV IS variants, this was directed by the Joint Requirements Office (JRO)		-	3.648	6.554
<b>Title:</b> 3) CALS - System Level Test and Evaluation <b>FY 2016 Accomplishments:</b> Initiated System Level Developmental Test (DT), Logistics Demonstration and contract verification testing for field confirmatory and theater validation variants. <b>FY 2017 Plans:</b> Continue System Level Developmental Test (DT), Logistics Demonstration and contract verification testing for field confirmatory and theater validation variants. <b>FY 2018 Plans:</b> Continue System Level Developmental Test (DT), Logistics Demonstration and contract verification testing for field confirmatory and theater validation variants. Initiate Operational Test for the Analytical Capability Sets (ACS).		0.150	3.182	7.293
<b>Title:</b> 4) CALS - System Integration Laboratory <b>FY 2017 Plans:</b> Continue system integration laboratory analysis risk reduction and activities to incorporate analysis of variant system configurations, capabilities, engineering controls, information assurance and DoD Information Assurance Certification and Accreditation Procedure (DIACAP) requirements. <b>FY 2018 Plans:</b> Complete system integration laboratory analysis risk reduction and activities to incorporate analysis of variant system configurations, capabilities, engineering controls, information assurance and DoD Information Assurance Certification and Accreditation Procedure (DIACAP) requirements.		-	0.400	0.642
<b>Title:</b> 5) CALS - Safety Release Internal Review Board		0.100	0.182	0.200

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Initiated the process for obtaining safety release for all CALS variants in preparation for Logistics Demonstration. Safety release for all equipment is required prior to utilizing active duty personnel for testing activities.</p> <p><b><i>FY 2017 Plans:</i></b> Continue the process for obtaining safety release for all CALS variants in preparation for Logistics Demonstration. Safety release for all equipment is required prior to utilizing active duty personnel for testing activities.</p> <p><b><i>FY 2018 Plans:</i></b> Continue the process for obtaining safety release for all CALS variants in preparation for Logistics Demonstration. Safety release for all equipment is required prior to utilizing active duty personnel for testing activities.</p>			
<p><b><i>Title:</i></b> 6) CALS - System Engineering and Program Management</p> <p><b><i>FY 2016 Accomplishments:</i></b> Continued System and Program Management Support to provide management and engineering, quality assurance and design support in preparation of Critical Design Review, manufacture of prototypes, and testing.</p> <p><b><i>FY 2017 Plans:</i></b> Continue System and Program Management Support to provide management and engineering, quality assurance and design support in preparation of Critical Design Review, manufacture of prototypes, and testing.</p> <p><b><i>FY 2018 Plans:</i></b> Continue System and Program Management Support to provide management and engineering, quality assurance and design support in preparation of Critical Design Review, manufacture of prototypes, and testing. Major system design changes are required during the EMD phase for the FC IS and TV IS variants, this was directed by the Joint Requirements Office (JRO).</p>	3.700	3.812	6.722
<b>Accomplishments/Planned Programs Subtotals</b>	6.880	11.224	21.411

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

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• JS0004: WMD - CIVIL SUPPORT TEAMS (WMD CST)	8.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	8.206
• JS0005: COMMON ANALYTICAL LABORATORY SYSTEM (CALS)	0.000	23.100	16.402	-	16.402	51.018	59.170	75.409	75.514	Continuing	Continuing

**Remarks**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> CM5 / <i>HOMELAND DEFENSE (EMD)</i>

**D. Acquisition Strategy**

**COMMON ANALYTICAL LABORATORY SYSTEM (CALs)**

The Common Analytical Laboratory System (CALs) will be developed using an Incremental approach, leveraging both Commercial Off the Shelf (COTS) and Government Off the Shelf (GOTS) analytical components to support the identification of Chemical, Biological, Radiological and Non-traditional agent materials in environmental samples technology. The (CALs) program is designed to provide an affordable, modular, scalable and sustainable field analytic capability that can be readily transported to meet the mission profile and requirements of the gaining organization. Increment 1 will consist of (3) variants which will be fielded, in accordance with mission need, to components of the Air Force, Army, Marines, Navy and National Guard Bureau requiring CBRN field confirmatory analytical detection capability. Post Milestone B (FY15), a hybrid contract (CPIF / FPI / FFP) was awarded to develop, design and build these system variant prototypes in order to conduct developmental test (DT) and evaluation. The Field Confirmatory Analytical Capability Set (FC ACS) will enter DT first and is expected to reach an early Milestone C - Low Rate Initial Production (LRIP) (FY17) followed by a Full Rate Production (FRP) Decision prior to the Milestone C (LRIP) (FY19) and (FRP) Decision for the FC and TV Integrated Systems. After each Milestone C, contracts will be awarded to produce the (3) variants of the Common Analytical Laboratory System using Fixed Price (FP) Contract vehicles.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CALS - HW S - ACS Operational Test (OT)	C/FP	TBD : TBD	0.000	0.000		0.000		3.439	Mar 2018	-		3.439	0.000	3.439	0.000
CALS - HW S Prototype System Manufacturing	C/CPIF	Battelle Memorial Institute : Columbus, OH	24.596	0.000		3.648	Jan 2017	6.554	Dec 2017	-		6.554	0.000	34.798	0.000
CALS - HW S - NGDS Tactical Variant Alpha Prototype	C/CPFF	BioFire Dx : Salt Lake City, UT	1.501	0.000		0.000		0.354	Mar 2018	-		0.354	0.000	1.855	0.000
<b>Subtotal</b>			26.097	0.000		3.648		10.347		-		10.347	0.000	40.092	0.000

<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CALS - ES S - CALS - Engineering Support System	C/FFP	Various : Various	4.843	2.930	Feb 2016	2.377	Feb 2017	3.308	Feb 2018	-		3.308	0.000	13.458	0.000
CALS - ES C - Other Government Agencies (DT/OT)	MIPR	Various : Various	0.000	0.000		0.000		0.946	Jan 2018	-		0.946	0.000	0.946	0.000
CALS - ES S - System Integration Laboratory Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.936	0.000		0.400	Jan 2017	0.642	Jan 2018	-		0.642	0.000	1.978	0.000
CALS - TD/D S - CALS - Safety Internal Review Board	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.182	Mar 2017	0.200	Mar 2018	-		0.200	0.000	0.382	0.000
<b>Subtotal</b>			5.779	2.930		2.959		5.096		-		5.096	0.000	16.764	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CALS - DTE S - DT/OT and LOGDEMO	C/CPIF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		1.267	Jan 2018	-		1.267	0.000	1.267	0.000
CALS - DTE S - System DT/OT and LOGDEMO	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		3.182	Feb 2017	1.818	Jan 2018	-		1.818	0.000	5.000	0.000
CALS - OTHT C - Operation Test Agencies	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.150	Jan 2016	0.000		1.977	Jan 2018	-		1.977	0.000	2.127	0.000
<b>Subtotal</b>			0.000	0.150		3.182		5.062		-		5.062	0.000	8.394	0.000

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CALS - PM/MS HW - Program Office - Planning and Programming	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	2.653	3.800	Mar 2016	1.435	Mar 2017	0.906	Jan 2018	-		0.906	0.000	8.794	0.000
<b>Subtotal</b>			2.653	3.800		1.435		0.906		-		0.906	0.000	8.794	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	34.529	6.880	11.224	21.411	-	21.411	0.000	74.044	-

**Remarks**



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: FY 2018 Chemical and Biological Defense Program</b>			<b>Date: May 2017</b>
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)	

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CALS - Developmental Test - (FC ACS)	■	■	■	■																								
CALS - System Verification Review - (FC ACS)				■																								
CALS - Functional Configuration Audit (FC ACS)				■																								
CALS - Log Demo - (FC ACS)				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CALS - Milestone C - (FC ACS)							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CALS - LRIP (FC ACS)								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CALS - Operation Test - (FC ACS)												■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CALS - Full Rate Production - (FC ACS)																												
CALS - Critical Design Review (FC IS)							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
CALS - Developmental Test (FC IS)																												
CALS - System Verification Review (FC IS)																												
CALS - Functional Configuration Audit (FC IS)																												
CALS - Log Demo (FC IS)																												
CALS - Milestone C (FC IS)																												
CALS - LRIP (FC IS)																												
CALS - Operational Test (FC IS)																												
CALS - Full Rate Production (FC IS)																												
CALS - Critical Design Review (TV IS)																												
CALS - Developmental Test (TV IS)																												
CALS - System Verification Review (TV IS)																												
CALS - Functional Configuration Audit (TV IS)																												
CALS - Log Demo (TV IS)																												
CALS - Milestone C (TV IS)																												
CALS - LRIP (TV IS)																												



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CM5 / HOMELAND DEFENSE (EMD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CALS - Developmental Test - (FC ACS)	1	2016	3	2016
CALS - System Verification Review - (FC ACS)	4	2016	4	2016
CALS - Functional Configuration Audit (FC ACS)	4	2016	4	2016
CALS - Log Demo - (FC ACS)	4	2016	1	2018
CALS - Milestone C - (FC ACS)	3	2017	4	2017
CALS - LRIP (FC ACS)	4	2017	4	2017
CALS - Operation Test - (FC ACS)	2	2018	2	2018
CALS - Full Rate Production - (FC ACS)	4	2018	4	2022
CALS - Critical Design Review (FC IS)	2	2017	3	2017
CALS - Developmental Test (FC IS)	1	2018	3	2018
CALS - System Verification Review (FC IS)	4	2018	4	2018
CALS - Functional Configuration Audit (FC IS)	4	2018	4	2018
CALS - Log Demo (FC IS)	3	2018	4	2018
CALS - Milestone C (FC IS)	3	2019	3	2019
CALS - LRIP (FC IS)	4	2019	4	2019
CALS - Operational Test (FC IS)	2	2020	2	2020
CALS - Full Rate Production (FC IS)	4	2020	4	2022
CALS - Critical Design Review (TV IS)	3	2017	3	2017
CALS - Developmental Test (TV IS)	3	2018	2	2019
CALS - System Verification Review (TV IS)	3	2019	3	2019
CALS - Functional Configuration Audit (TV IS)	3	2019	3	2019
CALS - Log Demo (TV IS)	1	2019	3	2019

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> CM5 / <i>HOMELAND DEFENSE (EMD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
CALS - Milestone C (TV IS)	4	2019	4	2019
CALS - LRIP (TV IS)	1	2020	2	2020
CALS - Operational Test (TV IS)	3	2020	4	2020
CALS - Full Rate Production (TV IS)	2	2021	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> CO5 / COLLECTIVE PROTECTION (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CO5: COLLECTIVE PROTECTION (EMD)	-	7.228	4.224	8.546	-	8.546	10.802	5.333	4.930	0.000	0	41.063
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Project supports Engineering and Manufacturing Development and Low Rate Initial Production (EMD/LRIP) of Joint Service Chemical, Biological, and Radiological (CBR) Collective Protection (CP) systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable enabling mission accomplishment in CBR environments. CP systems can be installed on any type of platform, such as, hard and soft shelters, vehicles, ships, aircraft, and buildings. CP systems provide spaces safe from the effects of CBR contamination. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting Concept of Operations (CONOPS) and Tactics, Techniques and Procedures (TTPs).

The systems included in this project are the Chemical-Biological Aircraft Survivability Barrier (CASB) and Joint Expeditionary Collective Protection (JECF) Family of Systems.

The CASB will be a new start in FY18 and provide a lightweight, low-cost, expendable, negative-pressure enclosure that will protect the interior of multi-service aircraft (H-47, V22, C-130) capable of airlifting/exfiltrating chemically or biologically contaminated personnel, equipment, contagious patients, and cargos while preserving the aircraft for continued unrestricted operations without need for extensive decontamination.

JECF provides the Joint Expeditionary Forces a CP capability which is lightweight, compact, modular, and affordable. A family of systems, developed in two phases, that will allow the application of CP to transportable soft-side shelters, enclosed spaces of opportunity, and in remote austere locations as a standalone resource. Phase 1 includes standalone CP systems and kits to provide existing host platforms and structures with CBRN protection. Phase 2 includes kits to provide other host platforms and structures that were not explicitly designed in Phase 1. JECF will be capable of protecting personnel groups of varying size, unencumbered by Individual Protective Equipment (IPE), from the effects of CB agents, Toxic Industrial Materials (TIMs), radiological particles, heat, dust, and sand. The employment of JECF is a strategic deterrence against enemy use of CBR agents or TIMs, and will reduce the need for personnel and equipment decontamination.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) Chemical and Biological Aircraft Survivability Barrier (CASB)	-	-	3.247
<b>Description:</b> Developmental Testing and Prototype Development			
<b>FY 2018 Plans:</b> Conduct Technical reviews to include a Technology Readiness Assessment (TRA), Manufacturing Readiness Assessment (MRA), Critical Design Review (CDR), Draft Request for Proposal (RFP), Lifecycle Sustainment Plan (LCSP) and Test and Evaluation			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CO5 / COLLECTIVE PROTECTION (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Master Plan (TEMP), Initiate Developmental Testing on prototypes to include chemical and biological filtration protection, swatch/permeation, reliability/availability.			
<b>Title:</b> 2) JECP - Phase 1 Low Rate Initial Production (LRIP) <b>Description:</b> Low rate initial production contract events.  <b>FY 2016 Accomplishments:</b> Continued updates to the technical manuals, training package and all logistic support products in preparation for Full Rate Production (FRP) / material release decision. Continued updates to the level III drawing package. Conducted physical configuration audit and full rate production manufacturing readiness assessment. Prepared for FRP.	4.842	-	-
<b>Title:</b> 3) JECP - Phase 1 Developmental and Operational Testing <b>Description:</b> Logistics demonstration, developmental and operational test events.  <b>FY 2016 Accomplishments:</b> Conducted MOT&E II without a field chemical simulant challenge to test the operational capabilities of the system to support service specific missions. Completed logistics demonstration.	2.386	-	-
<b>Title:</b> 4) JECP - Phase 2 System Development and Demonstration <b>Description:</b> Phase 2 system development and demonstration events.  <b>FY 2017 Plans:</b> Generate Engineering Change Proposal(s) and begin design and development of Phase 2 tent kits to address emerging service requirements for collective protection to new host platforms. Efforts will include prototyping, identifying and beginning changes to logistic support products and beginning update of the Govt owned Tech Data Package.  <b>FY 2018 Plans:</b> Continue design and development of Phase 2 tent kits to address emerging service requirements for collective protection to new host platforms. Continue prototyping, changes to logistic support products, and continue updates to the Govt owned Tech Data Package. Begin test planning and initiate developmental testing.	-	4.224	5.299
<b>Accomplishments/Planned Programs Subtotals</b>	7.228	4.224	8.546

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> CO5 / COLLECTIVE PROTECTION (EMD)
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**C. Other Program Funding Summary (\$ in Millions)**

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• JP1111: JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)	5.626	12.449	10.728	-	10.728	22.752	17.592	22.218	25.793	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

CHEMICAL BIOLOGICAL AIRCRAFT SURVIVABILITY BARRIER (CASB)

CASB will field a capability that will support the overall intent of the (Aircraft CBRN Contamination Survivability ACCS) Initial Capabilities Development (ICD) in the areas of barriers, aircraft containment systems, modular Collective Protection (ColPro) for aircraft interiors, and disposable ColPro. CASB is one member of a family of systems that will support the ICD. It will protect the interior of DoD airlift assets from incidental cross-contamination by CB-contaminated personnel and equipment and cargos under transport. The overall strategy is to utilize primary materials (air filtration and flexible barrier material) currently in use by other programs in the CB defense portfolio in a negative pressure system specifically designed for airframe use. CASB will review existing materials and technology as well as designs, configurations, and test data from legacy systems developed for ColPro applications. Using this information, systems will be developed to meet the broader range of airframes and airframe specific requirements, chemical biological protection and logistic supportability that are now required. Based on commonality between the requirements of the CASB and the requirements of similar programs (i.e. Joint Expeditionary Collective Protection, TIS, and Aeromedical Biological Containment System), CASB will be initiated at MS B EMD phase to meet these expanded requirements within the various airframes. CASB will use the Joint Enterprise-Research, Development, Acquisition, Production/Procurement (JE-RDAP) IDIQ contract to pursue a Commercial-of-the-Shelf (COTS)/Government-of-the-Shelf (GOTS) development strategy using full and open competition for awards following MS B and MS C. During the EMD phase, CASB intends to award a Cost Plus Incentive Fee (CPIF) delivery order for the development and delivery of prototypes for airworthiness certification within two years. During the Production phase, CASB intends to pursue a Fixed Price Incentive Fee (FPIF) delivery order to reduce the logistical burden and sustainment costs, including a 6-month option to transition the CASB from the JE-RDAP to the JE-CLaSS contract for long-term sustainment.

JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)

Strategy based on evolutionary development, based on a family of systems approach. After MS B, awarded competitive Cost Plus Incentive Fee (CPIF) contract to Science Applications International Corporation (now Leidos) in 2008 to build prototypes subjected to robust engineering developmental testing and Operational Assessment during the Engineering and Manufacturing Development (EMD) phase. After MS C, awarded a Firm Fixed Price (FFP) option to Leidos in September 2013 for Low Rate Initial Production (LRIP) systems to support formal Developmental Testing (DT) and Multi-Service Operational Test & Evaluation (MOT&E) events. In addition, a Fixed Price Incentive Firm Target (FPIF) option was awarded to Leidos in January 2014 to perform non-recurring engineering (NRE) and logistic product development associated with the LRIP system configurations. A post MS C Milestone Decision Authority Acquisition Decision Memorandum, dated March 2014, separated the program into two phases. Phase 2 systems will be developed as engineering changes to Phase 1 systems. The Full Rate Production (FRP) decision for

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 5	PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	CO5 / <i>COLLECTIVE PROTECTION (EMD)</i>

Phase 1 systems, dated December 2016, addressed business case analysis results and approved a full and open competition build-to-print production task order under the Joint Enterprise Research, Development, Acquisition, and Production/Procurement Contract. Phase 2 systems will undergo limited developmental and operational testing and then pursue a MS C full rate production decision. BA7 funding develops incremental improvements to fielded JECF variants.

**E. Performance Metrics**

N/A



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DE5: DECONTAMINATION SYSTEMS (EMD)	-	16.015	9.984	15.686	-	15.686	6.349	12.037	16.527	13.516	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides Engineering and Manufacturing Development (EMD) for: (1) Major Defense Acquisition Program (MDAP); (2) Contamination Indicator Decontamination Assurance System (CIDAS); (3) General Purpose Decontaminant (GPD); (4) Joint Service Equipment Wipe (JSEW); and (5) Joint Biological Agent Decontamination System (JBADS). Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

The MDAP CBRN Survivability Trail Boss ensures weapon system programs of all ACAT levels, as well as non-DoD agencies such as the Department of Homeland Security (DHS), meet their CBRN defense requirements. The initiative facilitates and coordinates the research, development, T&E, procurement, delivery, and life cycle sustainment of affordable CBRN defense materiel solutions to ACAT Program managers to meet their program's documented CBRN requirements. JSF Decon is an effort for MDAP.

The F-35 Joint Strike Fighter (JSF) Decontamination System MDAP project will develop an integrated decontamination containment system and decontaminant delivery system to support the JSF Program Office Live Fire Test and Evaluation (LFT&E) to satisfy specific F-35 decontamination requirements through aircraft-unique interfaces and demonstrate the aircraft's ability to meet CB decontamination and survivability requirements.

The CIDAS is a contamination indicator/decontamination assurance technology. It will consist of an indicator and an applicator, for which there will be three applicator configurations (small-scale, disposable large scale, and reusable large scale applicators) and three indicator formulations (training, nerve and blister indicators). The indicator will be sprayed on tactical vehicles, aircraft, ships, crew-served weapons, and individual weapons that may have been exposed to traditional and non-traditional chemical contamination. CIDAS is a new capability for the Joint Forces that will reduce the logistics burden of decontamination by indicating presence and location of traditional (Nerve and Blister) and non-traditional chemical agents on militarily relevant surfaces pre- and post-decontamination.

GPD is a liquid, field adjustable decontaminant for chemical and biological agents that will provide thorough decontamination capabilities for tactical vehicles, shipboard surfaces, crewserved weapons, and individual/personal weapons in hostile and non-hostile environments that have been exposed to traditional and non-traditional CB contamination while providing the lowest logistical footprint.

JSEW is a decontamination wipe that will provide immediate/operational decontamination capabilities for sensitive and non-sensitive equipment in hostile and non-hostile environments that have been exposed to chemical agents/contamination and shall decontaminate Nerve and Blister agents from a starting liquid challenge of 10 g/m2 to less than or equal to 1 g/m2 and non-traditional agents from a starting liquid challenge of 5 g/m2 to less than or equal to 1 g/m2. In addition, the JSEW is

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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intended to be a replacement for the Individual Equipment Decontamination Kit (M295). Follow on increments of JSEW may include biological agent capability and/or use on skin.

The JBADS will provide the capability to conduct biological and chemical agent decontamination of the interior and exterior of aircraft and vehicle platforms. The capabilities will be provided in two increments. Increment I will provide thorough biological decontamination of the interior and exterior of cargo aircraft. The JBADS Increment I is a capability set that will include a shelter to encapsulate an airframe, a decontamination delivery system (e.g. hot-humid air-blower, etc.), environmental control and monitoring system(s), and other ancillary components required to ensure efficacious biological agent decontamination. It will provide the capability to decontaminate biologically contaminated airframes to safe levels and allow more rapid return to service. Increment II will expand upon the Increment I capability set. Increment II will develop multiple decontaminants and modular designs to address various platforms and chemical agent decontamination.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) MDAP Support JSF DECON SYSTEM</p> <p><b>FY 2016 Accomplishments:</b> Provided prototype system design changes and proof of concept testing. Provided the prototype system along with engineering and technical support to the JSF Program Office Live Fire Test and Evaluation (LFT&amp;E) for Final System Demonstration.</p>	1.946	-	-
<p><b>Title:</b> 2) MDAP Support</p> <p><b>FY 2017 Plans:</b> Provide platform specific support for CBRN Survivability Assessments and integration of CBRN Detection, Protection and Decontamination assets.</p> <p><b>FY 2018 Plans:</b> Provide platform specific support for CBRN Survivability Assessments and integration of CBRN Detection, Protection and Decontamination assets.</p>	-	0.155	0.157
<p><b>Title:</b> 3) CIDAS Test and Evaluation and Support</p> <p><b>FY 2016 Accomplishments:</b> Completed electromagnetic environmental effects developmental testing (DT). Conducted additional DT of nerve indicators and applicators to include indication level, decontaminant compatibility, detector compatibility, equipment compatibility, IPE compatibility, natural environmental factors, packaging, survivability and Reliability, Availability and Maintainability. Developed Maintenance Task Analysis and Technical Manuals for Reusable Large Scale Applicator.</p> <p><b>FY 2017 Plans:</b> Complete DT for nerve indicator and applicators. Conduct Technology Readiness Assessment, Technical Manual Validation and System Verification Review for nerve indicators and applicators.</p> <p><b>FY 2018 Plans:</b></p>	5.324	4.591	5.777

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Receive LRIP deliveries and conduct Physical Configuration Audit of nerve indicator and applicators. Conduct Logistics Demonstration, Production Qualification Testing, and begin Multi-Service Operational Test and Evaluation of nerve indicator and applicators. Receive DT deliveries of blister indicator and prepare for DT.				
<p><b>Title:</b> 4) CIDAS LRIP Test and Evaluation</p> <p><b>Description:</b> Production Development</p> <p><b>FY 2016 Accomplishments:</b> Purchased 1253 CIDAS test assets (221 small scale applicators/nerve kits at \$295 each; 25 small scale applicators/training kits at \$162 each; 4 mid scale nerve indicator kits at \$1709 each; 20 mid scale training indicator kits at \$500 each; 810 large scale nerve indicator kits at \$2687 each, and 179 large scale training indicator kits at \$622 each) for DT; funded engineering support for engineering changes, training, test support and development of integrated product support deliverables. Developed disposable large scale applicator prototypes, conducted demonstrations and held a preliminary design review.</p> <p><b>FY 2017 Plans:</b> Procure 12 small scale nerve and training indicator and applicator kit test assets (at \$381 each) and conduct performance verification testing.</p> <p><b>FY 2018 Plans:</b> Conduct Physical Configuration Audit of nerve indicator and applicators. Manufacturers will support Logistics Demonstration, Production Qualification Testing, and preparation for Multi-Service Operational Test and Evaluation of nerve indicator and applicators. Award contract for blister indicator DT articles.</p>		1.272	0.169	3.706
<p><b>Title:</b> 5) GPD</p> <p><b>FY 2016 Accomplishments:</b> Completed Developmental Testing (to include biological efficacy, shelf life, and compatibility testing), conducted a Technology Readiness Assessment (TRA), Functional Configuration Audit (FCA)/System Verification Review (SVR) and funded Service Support for generation on an Operational Milestone Assessment Report (OMAR) in support of Milestone C/Low Rate Initial Production.</p>		3.124	-	-
<p><b>Title:</b> 6) JSEW</p> <p><b>FY 2016 Accomplishments:</b> Conducted a Technology Readiness Review (TRR), Functional Configuration Audit (FCA), System Verification Review (SVR), Production Readiness Review (PRR), Executed Follow-on DT to prove out an Engineering Change Proposal (ECP) and provided</p>		0.599	-	-

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Service Support for generating of program Operational Milestone Assessment Report (OMAR) in preparation for Milestone C/Low Rate Initial Production (LRIP) Decision.			
<b>Title:</b> 7) JBADS Increment I	2.423	5.069	5.923
<b>FY 2016 Accomplishments:</b> Received modified Aircraft Enclosure Level 3 Engineering Drawings to be used with the Development Request for Proposal (RFP) release. Prepared documentation to support Milestone B Decision and release of the RFP currently scheduled for release in January 2017.			
<b>FY 2017 Plans:</b> Initiate and complete source selection and contract award activities for 4QFY17 award; start design and fabrication of first article.			
<b>FY 2018 Plans:</b> Conduct Product Verification Testing on JBADS system to include MIL-STD 810 and Human Factors Assessment.			
<b>Title:</b> 8) JBADS Demonstration	1.327	-	-
<b>FY 2016 Accomplishments:</b> Purchased five (5) Room Decontamination Systems (RDSs), five (5) Aeroclave Distribution Ports, and one (1) transPortable Asset Decontamination System (tPADS) to support a demonstration to assess their capabilities and identify trade space of these potential alternative capabilities for JBADS Increment 2 in regard to chemical decontamination of vehicles and smaller sensitive equipment items.			
<b>Title:</b> 9) JBADS Increment II	-	-	0.123
<b>FY 2018 Plans:</b> Continue IPT and Tech Support for JBADS Increment II efforts. Expand Bio-Thermal Decontamination (BTD) technology and increase technology readiness level for Chemical Warfare Agent Hot Air Decontamination (CHAD).			
<b>Accomplishments/Planned Programs Subtotals</b>	16.015	9.984	15.686

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• JD0050: DECONTAMINATION FAMILY OF SYSTEMS (DFoS)	0.000	7.602	7.285	-	7.285	12.035	13.414	10.869	9.645	Continuing	Continuing
• JD0063: CONTAMINATED HUMAN REMAINS POUCH (CHRP)	1.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	1.100

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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**Remarks**

**D. Acquisition Strategy**

MAJOR DEFENSE ACQUISITION PROGRAM (MDAP)

MDAP is currently supporting the Joint Strike Fighter (JSF), Combat Rescue Helicopter (CRH, HH60 Recap), Abrams, Bradley, Armored Multipurpose Vehicle (AMPV), Stryker, Coast Guard Offshore Patrol Cutter (OPC), Coast Guard National Security Cutter (NSC), and Aegis Ashore. Additionally, the MDAP program is helping coordinate CBRN mission impact studies that will impact program manager's CBRN decision and risk matrices.

The F-35 Joint Strike Fighter (JSF) Decontamination System MDAP project is utilizing sole source contracting to leverage and integrate commercially available technologies to provide a decontamination delivery system for the Joint Strike Fighter Program Office in support of the JSF Live Fire Test and Evaluation (LFT&E). The Firm Fixed Price contracts have a period of performance to December 2016.

DFoS CONTAMINATION INDICATOR DECONTAMINATION ASSURANCE SYSTEM (DFoS CIDAS)

The CIDAS program will follow an evolutionary acquisition strategy in consonance with user developed capability documents. Following MS A, collaborated with program efforts, including the Hazard Mitigation, Materiel and Equipment Restoration (HaMMER) Advanced Technology Development Operational Demonstration and Extended User Evaluations, and conducted technology demonstrations on candidate indicator and applicator technologies to mitigate risk and identify affordable mature technologies that meet requirements. Determined need for and initiated Government designed reusable and disposable large scale applicators to provide affordable solutions to meet specific User requirements. Following MS B, used full and open competition to award a performance based indefinite quantity contract with fixed price incentive successive target contract line items, with options for LRIP and FRP for nerve indicator and small scale applicator systems. Will use a justification and approval to award a sole source, performance based indefinite quantity contract with price contract incentive successive target contract line items for a blister technology. Integrate and test the contractor and Government designs in the developmental and operational testing.

DFoS GENERAL PURPOSE DECONTAMINANT (DFoS GPD)

Due to the maturity levels of the systems entering the Technology Development (TD) phase, the Milestone Decision Authority (MDA) issued an Acquisition Decision Memorandum (ADM) which approved GPD to by-pass Milestone (MS) B and enter directly to MS C Low Rate Initial Production (LRIP). During the TD Phase, the GPD Program employed a Competitive Prototyping (CP) effort to facilitate the evaluation of Commercial Off The Shelf (COTS) technologies releasing a Request for Proposal (RFP) as a combined synopsis/solicitation for commercial and Non-Developmental Items (NDI), utilizing full and open competition. As the GPD Program entered the final phase of Technology Development (Developmental Test), the program continued to follow an evolutionary acquisition strategy. The production contract in support

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> DE5 / <i>DECONTAMINATION SYSTEMS (EMD)</i>
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of MS C is a single award for LRIP with four option years for FRP, using Full and Open Competition in accordance with FAR Subpart 6.1. This strategy ensures that all prospective sources, with the capability of meeting the program requirements, have the opportunity to participate.

**DFoS JOINT SENSITIVE EQUIPMENT WIPE (DFoS JSEW)**

Due to the maturity levels of the systems entering the Technology Development (TD) phase, the Milestone Decision Authority (MDA) issued an Acquisition Decision Memorandum (ADM) which approved JSEW to pursue a Milestone (MS) A to MS C Low Rate Initial Production (LRIP) acquisition strategy. During the TD Phase, the JSEW Program employed a Competitive Prototyping (CP) effort to facilitate the evaluation of Commercial Off The Shelf (COTS) technologies releasing a Request for Proposal (RFP) as a combined synopsis/solicitation for commercial and Non-Developmental Items (NDI), utilizing full and open competition. As the JSEW Program entered the final phase of Technology Development (Developmental Test), the program continued to follow an evolutionary acquisition strategy. The JSEW acquisition strategy used to support Developmental Testing (DT), Low Rate Initial Production (LRIP) and Full Rate Production (FRP) is a single contract award for DT (awarded 4QFY14), with options for LRIP and FRP, using Full and Open Competition in accordance with FAR Subpart 6.1. This strategy ensures that all prospective sources, with the capability of meeting the contract requirements, have the opportunity to participate.

**JOINT BIOLOGICAL AGENT DECONTAMINATION SYSTEM (JBADS)**

For Increment I, the program will leverage the Joint Biological Agent Decontamination System Joint Capability Demonstration (JCTD) and prior testing of candidate technologies to support a Milestone B decision in Engineering and Manufacturing Development (EMD), then a first article build to be retrofitted for fielding, if necessary, after a successful Operational Test and Fielding Decision.

JBADS Increment II will expand the biological agent decontamination capability to other platforms such as tactical and rotary wing aircraft, as well as ground vehicles. In addition, Increment II will provide chemical agent decontamination capabilities. Increment II will enter the acquisition process at Milestone B and a full and open Cost Plus Fixed Fee contract will be awarded to conduct the EMD phase. Candidate technologies will be evaluated during EMD to determine the most cost effective combination of biological and chemical agent decontamination for a variety of platforms. Following Milestone C/LRIP decision, a single, Firm Fixed Price production contract with full and open competition will be awarded.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MDAP - HW SB - JSF Decontamination Delivery System	SS/FFP	STERIS Corporation : Mentor, OH	0.364	0.729	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MDAP - HW SB - JSF Decontamination Shelter and Heater	SS/FFP	HDT Global : Fredericksburg, VA	0.192	0.397	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MDAP - HW SB - JSF Decontamination System Liner	SS/FFP	Production Products Inc. : St Louis, MO	0.433	0.733	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - HW S - Nerve Test Assets	C/FPIF	FLIR Detection : Inc, Stillwater, OK	0.986	2.840	Feb 2016	0.169	Nov 2016	0.424	Nov 2017	-		0.424	Continuing	Continuing	0.000
DFoS CIDAS - HW S - Blister Test Assets	C/FPIF	TBD : TBD	0.000	0.000		0.000		2.915	Nov 2017	-		2.915	Continuing	Continuing	0.000
DFoS CIDAS - HW S - Large Scale Applicator	MIPR	Various : Various	0.525	0.392	Nov 2015	0.221	Apr 2017	0.367	Nov 2017	-		0.367	Continuing	Continuing	0.000
DFoS GPD - HW S - GPD	MIPR	Various : Various	0.000	0.095	Apr 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS JSEW - HW S - Test Assets	C/FFP	STERIS Corporation : Mentor, OH	0.003	0.025	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS JSEW - HW S - JSEW	MIPR	Various : Various	0.000	0.078	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - HW C - Increment I Aircraft Enclosure	C/CPFF	Materials Engineering and Technical Support Services Corp. (METSS) : Westerville, OH	0.000	0.146	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - HW S - Concept Demo	MIPR	Aeroclave : LLC, Maitland, FL	0.000	0.377	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - HW S - Increment II Chemical Agent Decon Mods	C/FPIF	TBD : TBD	0.000	0.000		3.000	Jun 2017	0.123	Nov 2017	-		0.123	Continuing	Continuing	0.000
<b>Subtotal</b>			2.503	5.812		3.390		3.829		-		3.829	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MDAP - TD/D SB - IPT and Technical Support	MIPR	Various : Various	0.117	0.076	Oct 2015	0.124	Nov 2016	0.140	Nov 2017	-		0.140	Continuing	Continuing	0.000
DFoS CIDAS - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.549	1.243	Nov 2015	1.878	Nov 2016	1.831	Nov 2017	-		1.831	Continuing	Continuing	0.000
DFoS GPD - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.277	1.265	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS JSEW - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.141	0.162	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.000	1.294	Dec 2015	0.685	Nov 2016	0.842	Nov 2017	-		0.842	Continuing	Continuing	0.000
<b>Subtotal</b>			1.084	4.040		2.687		2.813		-		2.813	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DFoS CIDAS - DTE S - Live Agent / Lab and Operational Testing	MIPR	Various : Various	0.320	1.836	Jan 2016	1.540	Nov 2016	2.581	Nov 2017	-		2.581	Continuing	Continuing	0.000
DFoS GPD - DTE S - Developmental Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	2.135	0.658	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS GPD - DTE S - Developmental Testing #2	MIPR	Various : Various	0.963	0.972	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS JSEW - OTE S - Developmental Testing	MIPR	Various : Various	1.504	0.334	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - JBADS Increment I - Product Verification Testing	MIPR	Various : Various	0.000	1.128	Apr 2016	0.000		2.210	Nov 2017	-		2.210	Continuing	Continuing	0.000
JBADS - DTE S - Increment I IOT&E	MIPR	Various : Various	0.000	0.000		0.000		2.000	Nov 2017	-		2.000	Continuing	Continuing	0.000



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JBADS - OTHT S - ConMit Concept Demo	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.524	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - DTE S - Increment I Product Qualification Testing	MIPR	Various : Various	0.000	0.000		0.738	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			4.922	5.452		2.278		6.791		-		6.791	-	-	0.000

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MDAP - PM/MS SB - Program Management and Technical Support	MIPR	Various : Various	0.011	0.011	Jan 2016	0.031	Jan 2017	0.017	Nov 2017	-		0.017	Continuing	Continuing	0.000
DFoS CIDAS - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.000	0.285	Feb 2016	0.952	Nov 2016	1.365	Nov 2017	-		1.365	Continuing	Continuing	0.000
DFoS GPD - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.311	0.134	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - PM/MS S - Program Management & Tech Support	MIPR	Various : Various	0.000	0.281	Nov 2015	0.646	Nov 2016	0.871	Nov 2017	-		0.871	Continuing	Continuing	0.000
<b>Subtotal</b>			0.322	0.711		1.629		2.253		-		2.253	-	-	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	8.831	16.015	9.984	15.686	-	15.686	-	-	-

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MDAP - Final System Demonstration		■																										
MDAP - JSF LFT&E Support				■	■	■	■																					
DFOS - CIDAS CDR (Large Scale Applicator)	■																											
DFOS - CIDAS DT (Nerve Indicator and Applicators)	■	■	■	■	■	■	■																					
DFOS - CIDAS CPD (Nerve Indicator and Applicators)							■																					
DFOS - CIDAS MS C/LRIP									■																			
DFOS - CIDAS LRIP Delivery (Nerve Indicator and Applicators)									■	■	■	■																
DFOS - CIDAS OT (Nerve Indicator and Applicators)												■	■															
DFOS - CIDAS DT (Blister Indicator)												■	■	■	■													
DFOS - CIDAS FRP (Nerve Indicator and Applicators)														■	■	■	■	■	■	■	■	■	■	■	■	■	■	
DFOS - CIDAS CPD (Blister Indicator)																												
DFOS - CIDAS MS C/LRIP (Blister Indicator)																												
DFOS - CIDAS LRIP Delivery (Blister Indicator)																												
DFOS - CIDAS OT (Blister Indicator)																												
DFOS - CIDAS FRP (Blister Indicator)																												
DFOS - GPD CPD	■																											
DFOS - GPD DT	■	■	■	■																								
DFOS - GPD MRA Final Assessment		■																										
DFOS - GPD System Verification Review			■																									
DFOS - GPD MS C/LRIP							■																					
DFOS - GPD OT								■																				

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DFOS - GPD FRP																												
DFOS - GPD IOC																												
DFOS - GPD FOC																												
DFOS - JSEW DT																												
DFOS - JSEW System Verification Review																												
DFOS - JSEW MS C/LRIP																												
DFOS - JSEW CPD																												
DFOS - JSEW OT																												
DFOS - JSEW FRP																												
DFOS - JSEW IOC																												
DFOS - JSEW FOC																												
JBADS - Increment I Biothermal Decontamination Characterization Testing																												
JBADS - Capability Development Document																												
JBADS - Increment I MS B																												
JBADS - Increment I First Article Build																												
JBADS - Increment I Product Verification Testing																												
JBADS - Increment I Capability Production Document																												
JBADS - Increment I Initial Operational Test and Evaluation																												
JBADS - Increment I MS C / FRP																												
JBADS - Increment II Hot Air Dry Testing																												
JBADS - Increment II MS B																												
JBADS - Increment II Design Verification Testing																												

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
JBADS - Increment II EMD Contract Award																																
JBADS - Increment II MS C/LRIP																																

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDAP - Final System Demonstration	2	2016	2	2016
MDAP - JSF LFT&E Support	4	2016	2	2017
DFOS - CIDAS CDR (Large Scale Applicator)	1	2016	1	2016
DFOS - CIDAS DT (Nerve Indicator and Applicators)	1	2016	3	2017
DFOS - CIDAS CPD (Nerve Indicator and Applicators)	3	2017	3	2017
DFOS - CIDAS MS C/LRIP	1	2018	1	2018
DFOS - CIDAS LRIP Delivery (Nerve Indicator and Applicators)	2	2018	1	2019
DFOS - CIDAS OT (Nerve Indicator and Applicators)	4	2018	1	2019
DFOS - CIDAS DT (Blister Indicator)	4	2018	3	2019
DFOS - CIDAS FRP (Nerve Indicator and Applicators)	3	2019	4	2022
DFOS - CIDAS CPD (Blister Indicator)	4	2019	4	2019
DFOS - CIDAS MS C/LRIP (Blister Indicator)	4	2019	4	2019
DFOS - CIDAS LRIP Delivery (Blister Indicator)	2	2020	1	2021
DFOS - CIDAS OT (Blister Indicator)	2	2021	2	2021
DFOS - CIDAS FRP (Blister Indicator)	4	2021	4	2022
DFOS - GPD CPD	1	2016	1	2016
DFOS - GPD DT	1	2016	3	2016
DFOS - GPD MRA Final Assessment	2	2016	2	2016
DFOS - GPD System Verification Review	3	2016	3	2016
DFOS - GPD MS C/LRIP	2	2017	2	2017
DFOS - GPD OT	4	2017	4	2017
DFOS - GPD FRP	1	2018	1	2018

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> DE5 / DECONTAMINATION SYSTEMS (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
DFOS - GPD IOC	2	2018	2	2018
DFOS - GPD FOC	4	2021	4	2021
DFOS - JSEW DT	1	2016	1	2016
DFOS - JSEW System Verification Review	1	2016	1	2016
DFOS - JSEW MS C/LRIP	1	2017	1	2017
DFOS - JSEW CPD	2	2017	2	2017
DFOS - JSEW OT	2	2017	3	2017
DFOS - JSEW FRP	4	2017	4	2017
DFOS - JSEW IOC	4	2017	4	2017
DFOS - JSEW FOC	4	2019	4	2019
JBADS - Increment I Biothermal Decontamination Characterization Testing	1	2016	1	2016
JBADS - Capability Development Document	1	2017	1	2017
JBADS - Increment I MS B	2	2017	2	2017
JBADS - Increment I First Article Build	2	2018	3	2018
JBADS - Increment I Product Verification Testing	2	2018	4	2018
JBADS - Increment I Capability Production Document	1	2019	1	2019
JBADS - Increment I Initial Operational Test and Evaluation	1	2019	2	2019
JBADS - Increment I MS C / FRP	3	2019	3	2019
JBADS - Increment II Hot Air Dry Testing	2	2019	2	2019
JBADS - Increment II MS B	2	2021	2	2021
JBADS - Increment II Design Verification Testing	2	2021	1	2022
JBADS - Increment II EMD Contract Award	3	2021	3	2021
JBADS - Increment II MS C/LRIP	4	2022	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IP5: INDIVIDUAL PROTECTION (EMD)	-	19.720	11.427	14.481	-	14.481	11.600	4.500	3.371	3.370	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides Engineering & Manufacturing Development Phase and Low Rate Initial Production (EMD/LRIP) for individual protection equipment, with the goal of providing equipment that allows the individual soldier, sailor, airman, or Marine to operate in a contaminated Nuclear, Biological and Chemical (NBC) environment with little or no degradation of his/her performance. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, Concept of Operations (CONOPS) and Techniques, Tactics, and Procedures (TTP).

Efforts included in this project are: (1) the Joint Service Aircrew Mask (JSAM) for Rotary Wings (RW), JSAM Strategic Aircraft (SA), JSAM Tactical Aircraft (TA), JSAM Joint Strike Fighter (JSF), and (2) Uniform Integrated Protective Ensemble (UIPE) Increment 2.

(1) The JSAM RW, JSAM SA, JSAM TA, and JSAM-JSF are Acquisition Category (ACAT) III programs developed to provide respiratory and ocular protection. The JSAM will be a lightweight chemical and biological (CB) protective mask that will be worn as CB protection for most United States Army (USA), Air Force (USAF), Navy (USN), and Marine Corps (USMC) fixed wing and RW aircrew. All JSAM variants will be compatible with most below-the-neck (BTN) CB protection ensembles and existing aircrew life support equipment (ALSE). They will include a protective hood assembly, CB filter, blower assembly (except JSAM SA), and an intercom for ground communication. They will also provide flame protection, demist/emergency demist (except JSAM SA), and anti-drowning features. The goal of the JSAM programs is to develop, manufacture, field, and sustain an aircrew respirator system that, in conjunction with BTN clothing ensembles, will provide the capability for all aircrew to operate in an actual or perceived CB warfare environment.

The JSAM RW mask is being developed for use by pilots and aircrew in the majority of DoD RW aircraft in the USA (H-60, H-6, H-47, H-72), USAF (H-1 and H-60), and USN/USMC (H-60, H-1, and H-53). The JSAM RW will integrate with most BTN CB ensembles, normal aircrew flight equipment, and RW flight helmets. The system contains a removable face plate, allowing the user to fly "face free" in Mission Oriented Protective Posture (MOPP) 3 (garment, boots, and mask) and easily install the face plate when the threat level dictates, thereby reducing physiological and psychological burden. If threat level warrants, the user can install their face plate into an already donned hood and enter MOPP 4 without removing their flight helmet.

The JSAM SA mask will provide individual respiratory, ocular, and percutaneous protection of chemical and biological warfare agents, and select toxic industrial chemicals for USAF (E-3, E-8, C-135s, C-17, C-145, C-146, C-130s, C-5), Aeromedical personnel (C-130s, KC-10, U-18, CV-22, KC-135, C-12s, KC-46), USN (P-8, E-6, C-40, C-12, C-20), USMC (C-9, C-12, C-20, UC-35), and USA (RC-7, C-12s, C-20, C-26, UC-35, C-37) strategic aircrew. The mask components will be optimized to minimize their impact on the wearer's performance and maximize its ability to interface with aircrew protective clothing. JSAM SA will provide pressure breathing for altitude for aircraft that do not require pressure breathing for gravity. JSAM SA will integrate with aircraft subsystems which include aviation life support equipment,

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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aircrew flight equipment, aircraft seating, portable aircrew systems, communications systems, and aircraft oxygen systems. Prior to FY16, this project was funded under the JSAM FW funding line.

The JSAM TA mask will provide individual respiratory, ocular, and percutaneous protection of chemical and biological warfare agents, and select toxic industrial chemicals for USAF (F-22 A), USN (C-2 A, E-2 C/D, E/A-18G, F/A-18 A/C/E/F), and USMC (F/A-18 A/C/D, AV-8B, KC-130J and MV-22) tactical aircrew members. The mask components will be optimized to minimize their impact on the wearer's performance and maximize its ability to interface with aircrew protective clothing. JSAM TA will be compatible with anti-G systems, providing Chemical, Biological, Radiological (CBR) protection without degrading protection against gravity induced loss of consciousness (GLOC) up to 9 Gz . JSAM TA will integrate with essential aircraft subsystems. Prior to FY16, this project was funded under the JSAM FW funding line.

The JSAM-JSF is a CB respirator being specifically designed to support the F-35 (Joint Strike Fighter) and procured by the Joint Strike Fighter Program Office. It is designed to ensure that system integration and qualification of CB protection and survivability requirements are achieved as derived from the JSF Operational Requirements Document. When integrated with aircraft and pilot mounted equipment, the JSAM-JSF will provide combined CB, hypoxia and anti-G protection to all F-35 users, including the USAF, USN, USMC, and International Partners. Prior to FY15, this project was funded under the JSAM FW funding line.

(2) The Uniform Integrated Protection Ensemble (UIPE) is a Chemical, Biological, Radiological, Nuclear (CBRN) protective system offering the capability to select a tailored material solution based on the expected threat level commensurate with operational mission requirements. Where appropriate, a family of systems approach that meets the scope of UIPE individual protection capability needs will be utilized. The objective of UIPE is to fully integrate CBRN and toxic industrial material (TIM) protections into an ensemble, identical in fit and form to the combat uniform (including mask - helmet integration and protective boots and gloves), thus negating the need for separate protective ensemble components. This integrated protection approach will result in increased warfighter operational performance in a CBRN environment. The UIPE program will develop, integrate, test, procure and field incremental capability solutions that are modular in function and offer improvements in form and fit over current systems; the program will explore trade-space in areas such as protection level, heat stress, durability, antimicrobial properties, flame resistance, launderability, self-detoxification, and protection time in order to provide capabilities that afford maximum utility to the warfighter. Where appropriate modeling and simulation tools will be used to lower UIPE program risks, reduce costs, and ensure a high confidence in selected technologies. UIPE is aimed specifically at providing enhanced individual protection capabilities to the warfighter through reduction of physiological and psychological effects associated with CBRN protective garment thermal burden, weight, and bulk. The UIPE program will consider modernization in order to ensure that the warfighter retains access to state of the art capability to support future operational mission requirements.

The UIPE Increment 2 will seek to provide reduced thermal burden and weight compared to current protective ensembles. It will develop, integrate, test, procure, and field incremental capability solutions that are modular in function and offer improvements over current systems. The program will explore trade-space in areas such as protection level, heat stress, durability, antimicrobial properties, flame resistance, launderability, self-detoxification, and protection time in order to provide capabilities that afford maximum utility to the Warfighter. Where appropriate, modeling and simulation tools will be used to lower UIPE Increment 2 program risks, reduce costs, and ensure a high confidence in selected technologies.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) JSAM RW	5.277	0.940	0.382



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Description:</b> Developmental Testing (DT) and Multi-Service Operational Testing and Evaluation (MOT&amp;E)</p> <p><b>FY 2016 Accomplishments:</b> Completed USN/USMC aircraft integration testing, USAF laser eye protection testing, obtained fielding Safe-to-Fly release for USAF aircraft, and received USA/USAF Operational Evaluation Report. Completed provisioning and TM verification and conducted a Physical Configuration Audit.</p> <p><b>FY 2017 Plans:</b> Conduct Instructor and Key Personnel Training and New Equipment Training for the USN and USMC MOT&amp;E, conduct USN/USMC MOT&amp;E, and complete shipboard flight testing. Receive the final Operational Evaluation Report. Update JSAM RW technical documentation or implement potential changes by reconfiguration to the JSAM RW based on results of USN/USMC MOT&amp;E.</p> <p><b>FY 2018 Plans:</b> Complete follow-on USN/USMC MOT&amp;E test activities, and Low Rate Initial Production (LRIP) phase.</p>				
<p><b>Title:</b> 2) JSAM SA</p> <p><b>Description:</b> Developmental Testing and Multi-Service Operational Testing and Evaluation</p> <p><b>FY 2016 Accomplishments:</b> Completed Developmental Testing, including flight tests on the E-3 and P-8 aircraft. Conducted a System Verification Review, and Production Readiness Review. Initiated preliminary events leading to Operational Testing. Developed and finalized the Operational Test Agency Milestone Assessment Report. Conducted the Logistics Demonstration. Finalized the Technical Manual to be used during Operational Testing. Completed the Joint Integrated Logistics Assessment. Prepared for Milestone C (scheduled for 1QFY17), including updating program documentation, developing the Capability Production Document, and conducting various pre-Milestone C reviews.</p> <p><b>FY 2017 Plans:</b> Conduct Operational Testing for use on the E-3 (USAF), and P-8 (USN) aircraft. Develop the Operational Evaluation Report. Acquire final Safe-to-Fly certification aboard the E-3, and P-8 aircraft. Prepare for fielding decision to deploy masks to E-3, and P-8 aircrew. Update the technical manual, based on any findings from OT. Integrate the JSAM SA mask to subsequent aircraft, beyond the E-3, and P-8. Make any final product changes to the mask, based on any findings from Operational Testing.</p> <p><b>FY 2018 Plans:</b> Complete Operational Testing on the USA MC-12 and UC-35 aircraft. Conduct Developmental Testing, Integration Testing and Safe-to-Fly on various USAF and USN aircraft. Conduct engineering studies to assess communication system adaptors and</p>		6.320	3.539	2.097

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
oxygen system adaptors for several USAF and USN aircraft. Update the Technical Manual to include specialized procedures for several USAF, USN, and USA aircraft.				
<p><b>Title:</b> 3) JSAM TA</p> <p><b>Description:</b> Conduct Integration Testing Events</p> <p><b>FY 2016 Accomplishments:</b> Developed and finalized Test and Evaluation Master Plan, Life Cycle Sustainment Plan, Life Cycle Management Plan, Systems Engineering Plan, Programmatic Environment, Safety and Occupational Health Evaluation. Procured non-recurring engineering for JSAM TA development, prototype and test asset design, and manufacturing of 79 test assets at an estimated unit cost of \$8,429.10 for use in Integrated Test (IT) events. Conducted IT test events with JSAM TA platforms including ejection tower, water survival, sound attenuation/speech intelligibility, aircraft simulator for F-18, F-22, and MV-22.</p> <p><b>FY 2017 Plans:</b> Conduct test integration events on USAF and USN aircraft platforms.</p> <p><b>FY 2018 Plans:</b> Complete IT events with aircraft platforms including flight tests and shipboard testing. Update Technical Manuals, training package and conduct Logistics Demonstration. Receive Operational Test Agency (OTA) Letter of Observation or Observation of Operational Capabilities. Update program documentation in preparation of MS C/FRP.</p>		5.024	4.065	2.954
<p><b>Title:</b> 4) JSAM JSF</p> <p><b>Description:</b> Operational Test Event and Live Fire Test and Evaluation</p> <p><b>FY 2016 Accomplishments:</b> Completed Developmental Testing. Initiated JSF CB Live Fire Test and Evaluation event. Concluded Manufacturing Readiness Assessment. Conducted System Verification and Production Readiness Reviews supporting a Low Rate Initial Production decision. Conducted Instructor and Key Personnel Training and New Equipment Training. JSAM-JSF production contract was awarded to include initial delivery order for production assets.</p> <p><b>FY 2017 Plans:</b> Complete JSF Chemical and Biological Live Fire Test and Evaluation event. Conduct JSF Chemical and Biological Operational Test Event.</p>		3.099	1.883	-
<p><b>Title:</b> 5) UIPE - Increment 2</p> <p><b>Description:</b> System Development and Demonstration/Engineering and Manufacturing Development</p>		-	1.000	9.048

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b><i>FY 2017 Plans:</i></b> Begin concept development and design and continue system-level prototype testing. Conduct Preliminary Design Review (PDR) and Systems Requirements Review (SRR).			
<b><i>FY 2018 Plans:</i></b> Investigate mission profile requirements against available Commercial Off The Shelf/Non-Developmental Item (COTS/NDI) that could quickly meet Warfighter needs. Manufacture and conduct testing on applicable COTS/NDI.			
<b>Accomplishments/Planned Programs Subtotals</b>	19.720	11.427	14.481

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• J10002: JS AIRCREW MASK (JSAM)	2.705	52.284	36.782	-	36.782	54.775	60.278	63.806	63.110	Continuing	Continuing
• MA0401: CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)	32.872	13.525	10.990	-	10.990	13.064	16.769	19.336	71.335	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

JOINT SERVICE AIRCREW MASK ROTARY WING (JSAM RW)

The JSAM RW was developed under a competitive Cost Plus Fixed Fee contract, that included JSAM Apache and JSAM Apache Block III. A sole source Fixed Price Incentive (FPI) contract was awarded for LRIP. A Fixed Price modification to the sole source LRIP contract is anticipated to complete USAF and initiate Army TPF. A competitive Indefinite Delivery/Indefinite Quantity (IDIQ) production contract with FPI and FFP CLINs will be pursued for FRP. The FRP contract will also include Cost Plus CLINS for the vendor to establish a production line at Pine Bluff Arsenal.

JOINT SERVICE AIRCREW MASK STRATEGIC AIRCRAFT (JSAM SA)

The JSAM SA acquisition approach involves modifying the fielded M53 ground mask design in order to add Pressure Breathing for Altitude (PBA), up to 40,000 feet above sea-level, and middle ear equalization capabilities. The JSAM SA mask is intended to be fielded to the United States Air Force (USAF), United States Navy (USN), United States Marine Corps (USMC), and United States Army (USA). The RDT&E contract was awarded via sole source to Avon Protection Systems, Cadillac, Michigan to modify and field a commercially available mask (M53).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)

The overall acquisition strategy is to initially produce and field the JSAM SA masks incrementally. This approach allows the JSAM SA mask to be fielded to aircrew of the most applicable aircrafts in the shortest amount of time. At the end of all increments, the Services will have achieved their Full Operating Capability (FOC). The first increment will consist of fielding the JSAM SA mask to the USAF E-3 and USN P-8 aircrew. Based on technical difficulty and mission need, the JSAM SA program will work with the Services to determine which aircraft will be addressed in subsequent increments.

The overall test strategy involves four major phases. The first test phase consists of Design Verification Testing (DVT) which will evaluate developmental prototype masks prior to Critical Design Review (CDR). The second test phase is Developmental Testing (DT) to support Milestone C/LRIP. The third test phase is Operational Testing (OT) of assets to support IOC fielding to USAF E-3, USN P-8, USA MC-12, and USA UC-35 aircrew. The final test phase will consist of safe-to-fly and integration testing for all remaining aircraft.

The contract strategy consists of two sole-source contracts with Avon Protection Systems, the manufacturer of the base M53 mask. The first contract, which was awarded on 31 July 2013, covers all activities during Engineering and Manufacturing Development (EMD) phase. The second contract, which is planned to be awarded after Milestone C, will cover the activities during the Production and Deployment (PD) phase including all LRIP and FRP builds.

**JOINT SERVICE AIRCREW MASK TACTICAL AIRCRAFT (JSAM TA)**

The JSAM TA acquisition approach involves modifying the USN/USMC fielded A/P22P-14A series respirator design to meet aircraft integration requirements. The test strategy involves integrated testing (combined DT/OT) to be completed prior to MS C/FRP. The contract strategy consists of two sole source Firm Fixed Price (FFP) contracts with Cam Lock, Ltd. Aldershot Hampshire, United Kingdom. The first contract, to be awarded September 2016, covers all activities during the Engineering, Manufacturing, and Development (EMD) phase. The second contract will be a sole source FFP Indefinite Delivery/Indefinite Quantity (ID/IQ) and is planned for award after the Milestone C/FRP. The ID/IQ contract will cover the activities during the Production and Deployment phase including FRP builds. The JSAM TA mask is intended to be fielded to the USAF, USN, and USMC.

**JOINT SERVICE AIRCREW MASK JOINT STRIKE FIGHTER (JSAM-JSF)**

JSAM-JSF is specifically designed for the F-35 (Joint Strike Fighter) to be incorporated within the JSF platform and fielded to US Services and international partners. JSAM-JSF is being developed concurrently with other JSF equipment including life support and pilot flight equipment. JSAM-JSF initially leveraged a JSAM-FW design and shared the same base contract with a Cost Plus Incentive Fee delivery order.

**CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)**

The UIPE Increment 2 Family of Systems (FoS) will use an evolutionary acquisition strategy to develop a FoS that will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional CBRN threats. The FoS will be developed based on Service mission profiles with the goal being to minimize operational burden and provide improved fit, function, and integration with the current Warfighter kits compared to legacy systems. Pre-Milestone A activities included

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 5	PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	IP5 / <i>INDIVIDUAL PROTECTION (EMD)</i>

the exploration of available state of the art technologies through market research, Requests for Information, and a challenge competition; shaping realistic requirements by exploring trade space of novel technologies; and identified protection offered by non-chemical biological (CB) combat gear. The Technology Maturation and Risk Reduction (TMRR) phase will reduce technology, engineering, integration, and life-cycle cost risk. During this phase, the program will focus on forming mission profile areas designed to narrow the focus of solutions designed specifically for a certain Warfighter functional area. UIPE Increment 2 is a FoS and, therefore, will not be a single solution designed to have one suit meet the majority of Warfighter functions. Early testing will aide in deciding what is possible for each mission profile area and feed information in to the trade space analysis. Developmental/Operational Testing will assess the ability of the solution to meet requirements, determine contractual compliance with the Performance Specifications, demonstrate system technical performance in accordance with the operational requirements, and demonstrate performance in realistic conditions. An Other Transaction Authority (OTA) contracting approach will be used to procure informational white papers during the TMRR phase, prototypes, and test articles of possible solutions. The OTA consists of a consortium of all potential Industry, research institutions, and non-traditional government that could be potential solvers for the program. Procurement will be through either the OTA or a more traditional contracting vehicle. In special circumstances, procurement may be awarded under the OTA if the contract falls under the procedures pursuant to the rules and regulations specified for this OTA. Otherwise, a production contract will be awarded via a more traditional contracting vehicle.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
JSAM RW - HW C - M41 PATS Mask Leakage Tester	SS/FFP	TSI : Incorporated, Saint Paul, MN	0.000	0.210	Apr 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - HW S - Modified M53 - Design Modification and Development	SS/CPFF	AVON Protection Systems Inc. : Cadillac, MI	0.000	1.685	Nov 2015	0.207	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
JSAM TA - HW S - Hardware and Support Equipment for Integration and Test	SS/FFP	Cam Lock Limited : Aldershot Hampshire, UK	0.000	0.000		0.440	Dec 2016	0.155	Nov 2017	-		0.155	Continuing	Continuing	0.000
JSAM TA - HW S - ECPs, Test Assets and Test Support	SS/FFP	Cam Lock Limited : Aldershot Hampshire, UK	0.000	0.910	Sep 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM-JSF - HW S - Engineering and Manufacturing Contract	C/CPFF	GENTEX Corp. : Rancho Cucamonga, CA	1.366	1.129	Oct 2015	0.330	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - HW S - Prototype Development	Various	TBD : TBD	0.000	0.000		0.598	Jul 2017	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			1.366	3.934		1.575		0.155		-		0.155	-	-	0.000

<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
JSAM RW - ES S - Integrated Product Team/ Engineering/Technical Support	MIPR	Various : Various	4.615	1.197	Nov 2015	0.290	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - TD/D S - Logistics Demonstration	MIPR	Various : Various	0.000	0.116	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM SA - ES S - Engineering and IPT Support	MIPR	Various : Various	0.000	2.672	Jan 2016	1.779	Nov 2016	0.043	Nov 2017	-		0.043	Continuing	Continuing	0.000
JSAM TA - ES S - Engineering Support	MIPR	Various : Various	0.000	1.961	Nov 2015	1.353	Nov 2016	0.664	Nov 2017	-		0.664	Continuing	Continuing	0.000
JSAM-JSF - ES S - Engineering Support	MIPR	Various : Various	0.202	1.203	Oct 2015	0.642	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - ES S - Program Engineering/Technical IPT	Various	Various : Various	0.000	0.000		0.000		3.108	Nov 2017	-		3.108	Continuing	Continuing	0.000
<b>Subtotal</b>			4.817	7.149		4.064		3.815		-		3.815	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM RW - DTE S - Shipboard Testing (USN)	MIPR	Naval Air Warfare Center (Aircraft Division) : Patuxent River, MD	0.000	0.100	Sep 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM RW - DTE C - M41 PATS Performance Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.125	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM RW - DTE S - Developmental Testing (USA/USAF)	MIPR	Various : Various	1.067	0.030	Aug 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM RW - DTE S - Developmental and Aircraft Integration Testing (USN/USMC)	MIPR	Various : Various	3.361	0.954	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM RW - OTE S - Multi-Service Operational Testing (USN/USMC)	MIPR	Various : Various	0.000	1.233	Sep 2016	0.459	Nov 2016	0.382	Nov 2017	-		0.382	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
JSAM SA - DTE S - Developmental Testing	MIPR	Various : Various	0.000	1.553	Nov 2015	0.000		0.960	Nov 2017	-		0.960	Continuing	Continuing	0.000
JSAM SA - OTE S - Operational Testing	MIPR	Various : Various	0.000	0.000		1.102	Nov 2016	0.792	Nov 2017	-		0.792	Continuing	Continuing	0.000
JSAM TA - DTE S - Testing and Integration	MIPR	Various : Various	0.000	1.496	Nov 2015	1.754	Nov 2016	1.376	Nov 2017	-		1.376	Continuing	Continuing	0.000
JSAM TA - DTE/ OTE S - Integrated Testing (combined DT/OT)	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.000	0.000		0.000		0.333	Nov 2017	-		0.333	Continuing	Continuing	0.000
JSAM-JSF - OTE S - Live Fire Test & Evaluation	MIPR	Various : Various	0.000	0.000		0.671	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
JSAM-JSF - DTE S - Follow-On Developmental Testing	MIPR	Various : Various	0.000	0.084	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE - DTE S - Design Verification Testing	MIPR	TBD : TBD	0.000	0.000		0.200	Jul 2017	4.637	Nov 2017	-		4.637	Continuing	Continuing	0.000
<b>Subtotal</b>			4.428	5.575		4.186		8.480		-		8.480	-	-	0.000

<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
JSAM RW - PM/MS S - Program Management and Technical Support	Various	Various : Various	2.471	1.428	Dec 2015	0.191	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - PM/MS S - Program Management and Technical Support Services	MIPR	Various : Various	0.000	0.294	Nov 2015	0.451	Nov 2016	0.302	Nov 2017	-		0.302	Continuing	Continuing	0.000
JSAM TA - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.000	0.657	Nov 2015	0.518	Nov 2016	0.426	Nov 2017	-		0.426	Continuing	Continuing	0.000



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM-JSF - PM/MS S - Program Management and Technical Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.657	0.683	Oct 2015	0.240	Nov 2016	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - PM/MS S - PM/ SME Prog Mgt	MIPR	Various : Various	0.000	0.000		0.202	Jul 2017	1.303	Nov 2017	-		1.303	Continuing	Continuing	0.000
<b>Subtotal</b>			3.128	3.062		1.602		2.031		-		2.031	-	-	0.000
<b>Project Cost Totals</b>			13.739	19.720		11.427		14.481		-		14.481	-	-	-

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JSAM RW - USA/USAF Airworthiness Testing	■																											
JSAM RW - USN/USMC Airworthiness and Aircraft Integration Testing	■																											
JSAM RW - USN/USMC Shipboard Integration Testing				■	■	■	■	■																				
JSAM RW - USN/USMC Multi Service Operational Test and Evaluation					■	■	■																					
JSAM RW - USA/USAF Full Rate Production				■	■																							
JSAM RW - USAF Initial Operability Capability					■	■																						
JSAM RW - USN/USMC Full Rate Production										■	■																	
JSAM RW - USAF Full Operational Capability										■	■																	
JSAM RW - USA Initial Operational Capability																					■	■						
JSAM RW - USN/USMC Initial Operational Capability																						■	■					
JSAM SA - Developmental Testing	■	■	■	■																								
JSAM SA - MS C / Low Rate Initial Production Decision					■	■																						
JSAM SA - USAF/USN Operational Testing						■	■	■																				
JSAM SA - Full Rate Production										■	■																	
JSAM SA - USAF/USN Initial Operational Capability													■	■														
JSAM SA - USA Operational Testing															■	■												
JSAM SA - USA Initial Operational Capability																										■	■	
JSAM TA - AP22P (A) Safe to Fly Certification	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JSAM TA - Integrated (Developmental/Operational) Testing	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■



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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UIPE Increment 2 - Gated Material Testing																												
UIPE Increment 2 - Design Verification Testing																												
UIPE Increment 2 - Gated System Testing																												
UIPE Increment 2 - Mission Profile Decision Point 2																												
UIPE Increment 2 - Capability Development Document (CDD)																												
UIPE Increment 2 - Milestone B																												
UIPE Increment 2 - Developmental Testing/ Operational Testing																												
UIPE Increment 2 - Joint Integrated Logistics Assessment (JILA) Self Assessment																												
UIPE Increment 2 - Milestone C/Low Rate Initial Production																												
UIPE Increment 2 - Multi-Service Operational Test and Evaluation																												
UIPE Increment 2 - Capability Production Document (CPD)																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JSAM RW - USA/USAF Airworthiness Testing	1	2016	1	2016
JSAM RW - USN/USMC Airworthiness and Aircraft Integration Testing	1	2016	1	2016
JSAM RW - USN/USMC Shipboard Integration Testing	4	2016	4	2017
JSAM RW - USN/USMC Multi Service Operational Test and Evaluation	1	2017	2	2017
JSAM RW - USA/USAF Full Rate Production	1	2017	1	2017
JSAM RW - USAF Initial Operability Capability	2	2017	2	2017
JSAM RW - USN/USMC Full Rate Production	1	2018	1	2018
JSAM RW - USAF Full Operational Capability	2	2018	2	2018
JSAM RW - USA Initial Operational Capability	4	2018	4	2018
JSAM RW - USN/USMC Initial Operational Capability	4	2018	4	2018
JSAM SA - Developmental Testing	1	2016	3	2016
JSAM SA - MS C / Low Rate Initial Production Decision	1	2017	1	2017
JSAM SA - USAF/USN Operational Testing	2	2017	3	2017
JSAM SA - Full Rate Production	4	2017	4	2017
JSAM SA - USAF/USN Initial Operational Capability	2	2018	2	2018
JSAM SA - USA Operational Testing	3	2018	3	2018
JSAM SA - USA Initial Operational Capability	2	2019	2	2019
JSAM TA - AP22P (A) Safe to Fly Certification	1	2016	1	2019
JSAM TA - Integrated (Developmental/Operational) Testing	1	2016	1	2019
JSAM TA - AP22P (A) ECP Integration	1	2016	1	2019
JSAM TA - Capability Production Document	1	2019	1	2019
JSAM TA - MS C/ Full Rate Production	2	2019	4	2022

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IP5 / INDIVIDUAL PROTECTION (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
JSAM TA - Initial Operational Capability	4	2020	4	2020
JSAM-JSF - Developmental Testing	1	2016	2	2016
JSAM-JSF - Safe-to-Fly Certification	1	2016	4	2016
JSAM-JSF - Low Rate Initial Production Decision	1	2016	1	2016
JSAM-JSF - Manufacturing Readiness Assessment, System Verification Review, Production Readiness Review	1	2016	4	2016
JSAM-JSF - Instructor Key Personnel Training, New Equipment Training	3	2016	3	2016
JSAM-JSF - Production Contract Award	4	2016	4	2016
JSAM-JSF - Low Rate Initial Production Support	4	2016	4	2017
JSAM-JSF - Chemical and Biological Live Fire Test and Evaluation	4	2016	2	2017
JSAM-JSF - Physical Configuration Audit	1	2017	2	2017
UIPE Increment 2 - Baseline Ensemble Testing	1	2016	3	2016
UIPE Increment 2 - Design Concept/System Level Risk Reduction Testing	1	2016	2	2016
UIPE Increment 2 - Material Development/Tradespace Analysis	3	2016	4	2016
UIPE Increment 2 - Milestone A	1	2017	1	2017
UIPE Increment 2 - Mission Profile Decision Point 1	2	2017	2	2017
UIPE Increment 2 - Gated Material Testing	4	2017	2	2018
UIPE Increment 2 - Design Verification Testing	2	2018	3	2018
UIPE Increment 2 - Gated System Testing	2	2019	1	2020
UIPE Increment 2 - Mission Profile Decision Point 2	2	2020	2	2020
UIPE Increment 2 - Capability Development Document (CDD)	2	2020	2	2020
UIPE Increment 2 - Milestone B	2	2020	2	2020
UIPE Increment 2 - Developmental Testing/Operational Testing	4	2020	2	2021
UIPE Increment 2 - Joint Integrated Logistics Assessment (JILA) Self Assessment	4	2021	4	2021
UIPE Increment 2 - Milestone C/Low Rate Initial Production	1	2022	1	2022
UIPE Increment 2 - Multi-Service Operational Test and Evaluation	2	2022	2	2022

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> IP5 / <i>INDIVIDUAL PROTECTION (EMD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE Increment 2 - Capability Production Document (CPD)	4	2021	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IS5: INFORMATION SYSTEMS (EMD)	-	20.043	27.323	25.677	-	25.677	23.159	22.594	21.182	22.814	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project supports Engineering and Manufacturing Development and Low Rate Initial Production (EMD/LRIP). Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

Efforts included in this project are: (1) Chemical Biological Radiological and Nuclear Information Systems (CBRN IS); (2) Joint Effects Model (JEM); (3) Joint Warning and Reporting Network (JWARN); (4) Biosurveillance Portal (BSP); and (5) Software Support Activity (SSA).

CBRN IS aligns Joint Program Executive Office for Chemical Biological Defense (JPEO CBD) information technology in order to utilize a common software architecture, eliminate duplicative integration effort, produce interoperable system components, and minimize time-to-market of end user capability. JPEO CBD information technology is assembled from the inventory of available capability in place of the current paradigm where functionality only exists within the individual Joint Effects Model (JEM), Joint Warning and Report Network (JWARN), and Biosurveillance Portal (BSP) applications. CBRN IS aligns with the Joint Information Environment (JIE), such as milCloud, in order to field the integrated capabilities. The JIE is the cornerstone of the DoD's future - providing a secure information framework from our national senior leaders and joint force commanders, command and control forces that deliver responsive, decisive actions from any device; anytime and anywhere.

The Joint Effects Model (JEM) is a web-based software application that supplies the Department of Defense (DoD) with the one and only accredited tool to effectively model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. JEM is capable of providing all Warfighters with the ability to accurately model and predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM) events and effects. JEM supports planning to mitigate the effects of Weapons of Mass Destruction (WMD) and to provide rapid estimates of hazards and effects into the Common Operational Picture (COP).

Follow-on increments of JEM will refine and display hazard areas in near real time to reflect inputs such as meteorological, oceanographic, or actual agent concentration data. JEM will automatically receive input data from the Command, Control, Communications, Computers and Intelligence (C4I) system on which it resides, such as historical climatology, local observations, weather forecasts, natural environmental threats (i.e.: pandemic influenza, etc.), terrain data, intelligence information, or population data. JEM will also allow manual user input for factors such as concentrations of chemical warfare agents or actual exposure measurements and forecast sheltering stay-times and provide for modeling sheltering time through user-defined scenarios.

The Joint Warning and Reporting Network (JWARN) is an accredited Department of Defense (DOD) warning and reporting system that provides a standardized warning and reporting capability for Chemical, Biological, Radiological and Nuclear (CBRN) and Toxic Industrial Materials (TIM) incidents.



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> IS5 / <i>INFORMATION SYSTEMS (EMD)</i>
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JWARN supports the Joint Force Commander (JFC) by improving force protection capabilities for units operating in chemical, biological, radiological and nuclear environments. JWARN provides a digital display of CBRN 1-6 reports on the Common Operational Picture, displayed through Service provided C4I systems resident at all echelons of command. JWARN will be operated by CBRN and non-CBRN trained personnel operating in the operations center at various command nodes. This provides commanders with situational awareness to inform decision making for force protection criteria, unmasking operations, decontamination, and continuity of operations in a contaminated environment. Future sensor configurations will forward sensor inputs directly to JWARN via established communication lanes, removing the man-in-the-loop requirement with the current system configuration. JWARN will be information system classification agnostic and must be able to operate on unclassified, secret, top secret, and mission partner IT Systems without increasing system operator requirement, i.e.: sensor to COP via one communication loop. As a result, sensors will then be able to communicate with JWARN on the same network, regardless of classification.

JEM and JWARN utilize the Joint Capabilities Integration and Development System (JCIDS) Manual prescribed Information Technology Box (IT Box) construct for managing requirements for the follow-on increments of capability development. The "IT Box" is an acquisition approach and methodology regarding how software systems should be developed and fielded. It is a process that differs from the way DoD acquires hardware systems. The acquisition approach uses the Information Systems Initial Capabilities Document (IS ICD) to describe the required operational capabilities for the entire development effort. These overarching requirements are further broken out into Requirements Definition Packages (RDPs) released over the life of the product instead of a single Capability Development Document released early in the program. "Agile Software Development" is a set of industry standard software development methods used in conjunction with the IT Box framework. Agile Software Development promotes adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change. The Agile methodology is an alternative to traditional program management, typically used in software development. It helps teams respond to unpredictability through incremental, iterative work cadences, known as sprints. Agile methodologies are an alternative to waterfall, or traditional sequential development.

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

The Biosurveillance Portal (BSP) was a FY 2016 new start program to address USSOCOM requirements contained in an approved Information Systems Capability Development Document (IS CDD). BSP is a web-based enterprise environment that will facilitate collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological events. BSP bridges the communication gaps in the biosurveillance domain to provide a central access point for biosurveillance information and situational awareness for DoD, interagency and allied partners supporting the early identification and response to biological events. BSP provides an integrated suite of web-based components designed to support public health officers, environmental officers, clinicians, physicians, and CBRN personnel as they maintain their situational awareness of local, regional, and global biological threats to the force. BSP does not duplicate existing DoD capabilities, but rather leverages existing tools and technologies to provide users across multiple organizations and disciplines with a centralized "one-stop shop" for all of their biosurveillance resources.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

The BSP Program will utilize BA5 funding to execute the development, testing and evaluation of capabilities to meet the defined program requirements. There will be two Production CDs and two Engineering Drops in FY17. CDs will be evaluated following Developmental Testing (DT) through End-to-End Testing using Users to validate delivered capability as part of the IT Box process thus reducing risk to the program and ensure a quality product is delivered to the Warfighter.

As software-intensive systems, JEM, JWARN, and BSP have no separately identifiable unit production components. BSP, JEM, and JWARN are designated as ACAT III programs and unit cost calculations including Program Acquisition Unit Cost/Average Procurement Unit Cost (PAUC/APUC) and Operations and Sustainment (O&S) average annual per unit costs are not applicable.

The Software Support Activity (SSA) is a Chem-Bio Defense user developmental support and service organization to facilitate net-centric interoperability of systems in acquisition for the Warfighter. The SSA provides the CBRN Warfighter with Joint Service solutions for Cybersecurity/Information Assurance (IA), Integrated Architectures, Data Management/Modeling, Interoperability Certifications, Verification, Validation and Accreditation (VV&A) to support interoperable and integrated net-centric, service-oriented solutions for CBRN systems. The SSA emphasizes development of reference implementations to guide Government and industry system and software developers to ensure that their products meet common interoperability standards. The latest technologies/products include the definition of a Common CBRN Sensor Integration Standard (CCSI) and the CBRN Data Model. These technologies and direct enablers for the development of CBRN integrated sensor networks and the dissemination of CBRN information across all users. The SSA directly supports Chemical and Biological Defense Program (CBDP) initiatives by providing common service oriented architectures and frameworks for the collection and dissemination of Bio-Surveillance and other critical CBRN information.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) BSP Product Development	6.954	8.101	5.319
<p><b>FY 2016 Accomplishments:</b> Developed and integrated BSP capabilities for inclusion in Capability Releases. This included architecture development, system design, key system tools, third party developed models, access to external data sources, information assurance, and host platform design.</p> <p><b>FY 2017 Plans:</b> Continue the development and integration of BSP capabilities for inclusion in capability releases. This includes architecture development, system design, key system tools, third party developed models, access to external data sources, cybersecurity and information assurance, and host platform design.</p> <p><b>FY 2018 Plans:</b> Continue the development and integration of BSP capabilities for inclusion in capability releases. This includes architecture development, system design, key system tools, third party developed models, access to external data sources, cybersecurity and information assurance, and host platform design.</p>			
<b>Title:</b> 2) BSP Developmental Test and Evaluation	0.998	0.984	0.991

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Tested of BSP Capability Releases as required in accordance with the BSP Test and Evaluation Master Plan (TEMP).</p> <p><b><i>FY 2017 Plans:</i></b> Continue to conduct Joint and Service developmental testing of BSP capability releases as required in accordance with the BSP Test and Evaluation Master Plan (TEMP). Execute Follow-On Test (FOT) as directed in USSOCOM Conditional Fielding and Deployment Release memorandum.</p> <p><b><i>FY 2018 Plans:</i></b> Continue Developmental Testing associated with planned two Production Capability Drops and two Engineering Drops per FY. Planned cybersecurity testing in conjunction with cloud host provider requirements.</p>			
<p><b><i>Title:</i></b> 3) BSP Program Management Support</p> <p><b><i>FY 2016 Accomplishments:</i></b> Provided management of all aspects of BSP development and testing. Tasks will include, planning, budgeting, execution oversight, risk management, user feedback, scheduling, and administration.</p> <p><b><i>FY 2017 Plans:</i></b> Continue support for the management of all aspects of BSP development and testing. Tasks will include, planning, budgeting, execution oversight, risk management, user feedback, scheduling, and administration.</p> <p><b><i>FY 2018 Plans:</i></b> Management and oversight of all aspects of BSP program development and testing. Tasks include planning, budgeting, execution oversight, risk management, test and user feedback coordination, scheduling, training and administration.</p>	0.867	1.003	1.114
<p><b><i>Title:</i></b> 4) BSP Operational Testing and Evaluation</p> <p><b><i>FY 2016 Accomplishments:</i></b> Conducted Operational Testing of BSP in a realistic operational environment prior to fielding decision to determine system suitability and supportability. Support will consist of test support personnel as well as engineering, and operational support.</p> <p><b><i>FY 2017 Plans:</i></b> Continue Operational Testing of BSP in a realistic operational environment prior to fielding decision to determine system suitability and supportability. Support will consist of test support personnel as well as engineering, and operational support.</p> <p><b><i>FY 2018 Plans:</i></b> Continue Operational Testing of BSP through End-to-End testing of planned Production Capability Drops to validate capabilities prior to delivery to the Warfighters. Support will consist of test support personnel as well as engineering, and</p>	1.135	1.486	1.091

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
operational support. Two User Feedback events are planned per FY.			
<b>Title:</b> 5) CBRN IS - Technical Guidance <b>FY 2017 Plans:</b> Define CBRN IS Technical Guidance. <b>FY 2018 Plans:</b> Continue to define CBRN IS Technical Guidance.	-	0.500	0.298
<b>Title:</b> 6) CBRN IS - Standardization <b>FY 2017 Plans:</b> Ensure BSP, JEM, JWARN are built using industry standards and best practices that are consistent with CBRN IS. <b>FY 2018 Plans:</b> Continue to ensure BSP, JEM, JWARN are built using industry standards and best practices that are consistent with CBRN IS.	-	0.800	0.477
<b>Title:</b> 7) CBRN IS - Cybersecurity / Information Assurance <b>FY 2017 Plans:</b> Implement cybersecurity lock-downs for CBRN and achieve an Authority To Operate. <b>FY 2018 Plans:</b> Continue further implementations of cybersecurity lock-downs for CBRN and maintain an Authority To Operate.	-	0.500	0.277
<b>Title:</b> 8) CBRN IS - Product Development <b>FY 2017 Plans:</b> Install CBRN IS on milCloud and other data centers. "milCloud" is a cloud-services product portfolio, managed by DISA. milCloud allows our users to access our web-enabled products world-wide without having the application directly installed on their machines. Ensure it can be operational 24/7. <b>FY 2018 Plans:</b> Continue installations of CBRN IS on milCloud and other data centers. "milCloud" is a cloud-services product portfolio, managed by DISA. milCloud allows our users to access our web-enabled products world-wide without having the application directly installed on their machines. Ensure operational 24/7.	-	2.339	1.394
<b>Title:</b> 9) CBRN IS - Operational Assessments <b>FY 2017 Plans:</b>	-	1.500	0.915

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Conduct Operational Assessments of CBRN IS in various operational environments.				
<b>FY 2018 Plans:</b> Continue Operational Assessments of CBRN IS in various operational environments.				
<b>Title:</b> 10) JEM Increment 2 - Developmental Test and Evaluation		0.677	0.656	1.043
<b>FY 2016 Accomplishments:</b> Completed Government Development Test of RDP 1.				
<b>FY 2017 Plans:</b> Continue Government Development Test of RDP 2, software deliveries in Command and Control (C2) environments. Continue test of JEM Increment 2 implementation in the DISA milCloud environment. Perform verification, validation, and accreditation of new hazard prediction models provided by the S&T community.				
<b>FY 2018 Plans:</b> Continue Government Development Test of software deliveries in Command and Control (C2) environments. Perform verification, validation, and accreditation of new hazard prediction models provided by the S&T community as defined in Requirements Definition Package 3.				
<b>Title:</b> 11) JEM Increment 2 - Program Development		1.005	1.051	1.676
<b>FY 2016 Accomplishments:</b> Developed JEM Increment 2 software and performed integration into Command and Control (C2) systems.				
<b>FY 2017 Plans:</b> Continue development of JEM Increment 2 software and perform integration into Command and Control (C2) systems. Integrate new hazard prediction models provided by the S&T community into the JEM Increment 2 baseline software.				
<b>FY 2018 Plans:</b> Continue development of JEM Increment 2 software and perform integration into Command and Control (C2) systems. Integrate new hazard prediction models provided by the S&T community into the JEM Increment 2 baseline software and develop/transition new S&T capabilities as defined in Requirements Definition Package 3.				
<b>Title:</b> 12) JEM Increment 2 - Program Management		0.833	0.674	0.774
<b>FY 2016 Accomplishments:</b> Completed Fielding Decision and IOC of Stand Alone capabilities of JEM Increment 2. Continue to perform program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM Increment 2. Continue development and execution of RDP-1 requirements for JEM Increment 2 while working within the agile development process, to include performing				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in order to deploy JEM Increment 2 to the services. Complete development of Requirements Definition Package 2 (RDP-2), which defines requirements for C2 systems integration of the JEM software. Complete fielding decision and IOC of C2 systems capabilities of JEM Increment 2.</p> <p><b>FY 2017 Plans:</b> Continue to perform program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM Increment 2. Manage transitions of mature science and technology from JSTO into the JEM increment 2 program. Continue development and execution of Build Decision 2 (BD2) for JEM Increment 2 while working within the agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in order to deploy JEM Increment 2 to the services. Complete development of Requirements Definition Package 2 (RDP-2), which defines requirements for C2 systems integration of the JEM software.</p> <p><b>FY 2018 Plans:</b> Continue to perform program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM Increment 2. Continue development and execution of JEM Increment 2 while working within the agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics Demonstration (LOG DEMO) in order to deploy JEM Increment 2 to the services and to the Science and Technology Community.</p>			
<p><b>Title:</b> 13) JEM Increment 2 - Operational Test and Evaluation</p> <p><b>FY 2016 Accomplishments:</b> Completed lab based OT and limited scope service specific IOT&amp;E to support fielding of software with additional capability. Conduct Service C2 Follow-on Test and Evaluation (FOT&amp;E) which will allow for IOC of JEM Increment 2 on service C2 systems.</p> <p><b>FY 2017 Plans:</b> As a continuation of the agile development process, for each IT Box Capability Drop (CD), develop operational test plans and conduct lab based OT and limited scope service specific IOT&amp;E to support fielding decisions for the JEM Increment 2 software. Continue Service C2 and DISA milCloud Follow-on Test and Evaluation (FOT&amp;E) of JEM Increment 2 on service C2 systems and the milCloud environment.</p> <p><b>FY 2018 Plans:</b> Develop operational test plans and conduct lab based OT and limited scope service specific IOT&amp;E to support fielding decisions for the JEM Increment 2 software.</p>	1.037	0.539	1.162
<p><b>Title:</b> 14) JWARN Increment 2 - Management Support</p> <p><b>FY 2016 Accomplishments:</b></p>	0.574	0.735	0.787

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued development and execution of Build Decisions (BDs) for JWARN Increment 2 while working within the Agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in preparation for test and deployment of JWARN Increment 2 to the services.  <b>FY 2017 Plans:</b> Provide program/financial management, costing, contracting, scheduling and acquisition oversight for JWARN Increment 2. Continue development and execution of Build Decisions (BDs) for JWARN Increment 2 while working within the Agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in preparation for test and deployment of JWARN Increment 2 to the services.  <b>FY 2018 Plans:</b> Provide program/financial management, costing, contracting, scheduling and acquisition oversight for JWARN Increment 2. Continue development and execution of Build Decisions (BDs) for JWARN Increment 2 while working within the Agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in preparation for test and deployment of JWARN Increment 2 to the services.			
<b>Title:</b> 15) JWARN Increment 2 - Product Development  <b>FY 2016 Accomplishments:</b> Continued JWARN Increment 2 software development and perform integration into Command and Control (C2) systems. Initiated integration of CBRN sensor/detector data/input with JWARN software baseline.  <b>FY 2017 Plans:</b> Continue JWARN Increment 2 software development and perform integration into Command and Control (C2) systems and integration of CBRN sensor/detector data/input with JWARN software baseline.  <b>FY 2018 Plans:</b> Continue JWARN Increment 2 software development and perform integration into Command and Control (C2) systems and integration of CBRN sensor/detector data/input with JWARN software baseline.	2.609	3.196	4.475
<b>Title:</b> 16) JWARN Increment 2 - Developmental Test and Evaluation  <b>FY 2016 Accomplishments:</b> Completed Government development test and evaluation of software deliveries in preparation for Initial Operational Test and Evaluation (IOT&E) which will allow for Initial Operational Capability of JWARN Increment 2 to be deployed to the services.  <b>FY 2017 Plans:</b>	0.257	0.329	0.634

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Continue Government development test and evaluation of software deliveries in preparation for annual Multiservice Operational Test and Evaluation (MOT&amp;E) which will allow for Initial Operational Capability of JWARN Increment 2 to be deployed to the services.</p> <p><b>FY 2018 Plans:</b> Continue Government development test and evaluation of software deliveries in preparation for annual Multiservice Operational Test and Evaluation (MOT&amp;E) which will allow for Initial Operational Capability of JWARN Increment 2 to be deployed to the services.</p>				
<p><b>Title:</b> 17) JWARN Increment 2 - Operational Test and Evaluation</p> <p><b>FY 2016 Accomplishments:</b> Completed Initial Operational Test and Evaluation (IOT&amp;E) which will allow for Initial Operational Capability (IOC) of JWARN Increment 2 to be deployed to the services.</p> <p><b>FY 2017 Plans:</b> Conduct Multiservice Operational Test and Evaluation (MOT&amp;E) which will allow for additional Capability Drops (CDs) of JWARN Increment 2 capabilities and functionality to be deployed to the services.</p> <p><b>FY 2018 Plans:</b> Conduct Multiservice Operational Test and Evaluation (MOT&amp;E) which will allow for additional Capability Drops (CDs) with added JWARN Increment 2 capabilities and functionality to be deployed to the services.</p>		1.229	0.809	0.937
<p><b>Title:</b> 18) SSA Policies, Standards and Guidelines</p> <p><b>FY 2016 Accomplishments:</b> Continued updates to acquisition documentation for CBRN IT systems based on changes in policy, procedures, and guidelines. Performed surveillance of Federal Information Security Management Act (FISMA) and DoD Acquisition policies necessary to maintain certification on deployed service platforms. Provided M&amp;S strategic and accreditation support.</p> <p><b>FY 2017 Plans:</b> Continue updates to acquisition documentation for CBRN IT systems based on changes in policy, procedures, and guidelines. Perform surveillance of Federal Information Security Management Act (FISMA) and DoD Acquisition policies necessary to maintain certification on deployed service platforms. Provide M&amp;S strategic and accreditation support.</p> <p><b>FY 2018 Plans:</b></p>		0.211	0.235	0.256



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue updates to acquisition documentation for CBRN IT systems based on changes in policy, procedures, and guidelines. Perform surveillance of Federal Information Security Management Act (FISMA) and DoD Acquisition policies necessary to maintain certification on deployed service platforms. Provide M&S strategic and accreditation support.				
<b>Title:</b> 19) SSA Integrated Architecture		0.247	0.276	0.301
<b>FY 2016 Accomplishments:</b> Continued to perform required modifications to the Integrated Architecture on host platforms and document the infrastructure and technical standards. Conducted Net-Centric Assessments for programs. Reviewed and updated the Common CBRN Interface standards on operational systems, including a CCSI.				
<b>FY 2017 Plans:</b> Continue to perform required modifications to the Integrated Architecture on host platforms and document the infrastructure and technical standards. Conduct Net-Centric Assessments for programs. Review and update the Common CBRN Interface standards on operational systems, including a CCSI.				
<b>FY 2018 Plans:</b> Continue to perform required modifications to the Integrated Architecture on host platforms and document the infrastructure and technical standards. Conduct Net-Centric Assessments for programs. Review and update the Common CBRN Interface standards on operational systems, including a CCSI.				
<b>Title:</b> 20) SSA Enterprise Support and Services		0.177	0.197	0.215
<b>FY 2016 Accomplishments:</b> Continued to support processes and services for Architectures, Data, Information Assurance, Modeling and Simulation, Science and Technology, and Standards and Policy. Modified support processes and services necessary to maintain relevancy in accordance with DoD standards, policies, and guidelines.				
<b>FY 2017 Plans:</b> Continue to support processes and services for Cybersecurity/Information Assurance, Architectures, Modeling and Simulation, Science and Technology, and Standards and Policy. Modify support processes and services necessary to maintain relevancy in accordance with DoD standards, policies, and guidelines.				
<b>FY 2018 Plans:</b> Continue to support processes and services for Cybersecurity/Information Assurance, Architectures, Modeling and Simulation, Science and Technology, and Standards and Policy. Modify support processes and services necessary to maintain relevancy in accordance with DoD standards, policies, and guidelines.				
<b>Title:</b> 21) SSA Chemical, Biological, Radiological, Nuclear (CBRN) Data Model		0.198	0.221	0.241

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b><i>FY 2016 Accomplishments:</i></b> Developed and updated CBRN data model and define the structure and content of information exchange "Extensible Markup Language"(XML) schemas that support interoperability between CBD programs.</p> <p><b><i>FY 2017 Plans:</i></b> Continue to develop and update CBRN data model and define the structure and content of information exchange "Extensible Markup Language"(XML) schemas that support interoperability between CBD programs.</p> <p><b><i>FY 2018 Plans:</i></b> Continue to develop and update CBRN data model and define the structure and content of information exchange "Extensible Markup Language"(XML) schemas that support interoperability between CBD programs.</p>			
<p><b><i>Title:</i></b> 22) SSA Cybersecurity / Information Assurance</p> <p><b><i>FY 2016 Accomplishments:</i></b> Continued to employ Information Systems Security Engineering efforts to develop or modify the IA component of a system architecture to ensure it is in compliance with the IA component of the Global Information Grid architecture, and makes maximum use of enterprise IA capabilities and services.</p> <p><b><i>FY 2017 Plans:</i></b> Continue to employ Information Systems Security Engineering (Cybersecurity) efforts to develop or modify the Cybersecurity/ Information Assurance (CS/IA) component of a system architecture to ensure it is in compliance with the IA component of the Global Information Grid architecture, and makes maximum use of enterprise CS/IA capabilities and services.</p> <p><b><i>FY 2018 Plans:</i></b> Continue to employ Information Systems Security Engineering (Cybersecurity) efforts to develop or modify the Cybersecurity/ Information Assurance (CS/IA) component of a system architecture to ensure it is in compliance with the IA component of the Global Information Grid architecture, and makes maximum use of enterprise CS/IA capabilities and services.</p>	0.423	0.509	0.556
<p><b><i>Title:</i></b> 23) SSA Policy and Standards Repository</p> <p><b><i>FY 2016 Accomplishments:</i></b> Continued to provide standards, formats, templates, training, and best practices to support practical compliance with laws, regulations, and policy for acquisition, certification, and sustainment of net-centric, interoperable, and spectrum dependent systems and devices.</p> <p><b><i>FY 2017 Plans:</i></b></p>	0.355	0.396	0.432

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue to provide standards, formats, templates, training, and best practices to support practical compliance with laws, regulations, and policy for acquisition, certification, and sustainment of net-centric, interoperable, and spectrum dependent systems and devices.			
<b>FY 2018 Plans:</b> Continue to provide standards, formats, templates, training, and best practices to support practical compliance with laws, regulations, and policy for acquisition, certification, and sustainment of net-centric, interoperable, and spectrum dependent systems and devices.			
<b>Title:</b> 24) SSA Technology Transition Support	0.257	0.287	0.312
<b>FY 2016 Accomplishments:</b> Continued to perform Technology Transition support services (common components and services) for CBD programs.			
<b>FY 2017 Plans:</b> Continue to perform Technology Transition support services (common components and services) for CBD programs.			
<b>FY 2018 Plans:</b> Continue to perform Technology Transition support services (common components and services) for CBD programs.			
<b>Accomplishments/Planned Programs Subtotals</b>	20.043	27.323	25.677

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• IS7: INFORMATION SYSTEMS (OP SYS DEV)	7.556	10.357	12.203	-	12.203	15.552	16.951	16.492	15.163	Continuing	Continuing
• G47101: JOINT WARNING & REPORTING NETWORK (JWARN)	0.000	3.889	0.981	-	0.981	0.502	0.445	0.400	0.375	Continuing	Continuing
• JC0208: JOINT EFFECTS MODEL (JEM)	3.316	3.069	0.983	-	0.983	0.911	0.696	0.731	0.746	Continuing	Continuing
• JS5230: SOFTWARE SUPPORT ACTIVITY (SSA)	0.100	0.300	0.096	-	0.096	0.094	0.082	0.075	0.071	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
BIOSURVEILLANCE PORTAL (BSP)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> IS5 / <i>INFORMATION SYSTEMS (EMD)</i>

The Biosurveillance Portal (BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20.

**CBRN INFORMATION SYSTEMS**

CBRN IS utilizes the agile construct for software requirements management and development. The intent is to scan the programs within the JPEO CBD, DTRA, and other sources for IT assets that can be hosted in a cloud environment and provide a CBRN capability for the warfighter. Once a program has been identified for integration into CBRN IS, an evaluation will occur in order to see if any changes are necessary. Modifications will be completed in coordination with the developer of the capability in order to be in alignment with CBRN IS guidelines.

**JOINT EFFECTS MODEL (JEM)**

JEM Increment 2 acquisition will utilize the JROC's "IT Box" construct for software development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and fielding products to the service more frequently than an incremental delivery approach.

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

As part of this strategy a single JEM integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in December 2013.

The current contractor for JEM Increment 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> IS5 / <i>INFORMATION SYSTEMS (EMD)</i>
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follow-on contract in FY17 will include scope for developing the remaining capabilities under the JEM 2.0 contract. The JEM follow-on contract will utilize full and open competition and will be referred to as the JEM development, modernization and sustainment contract.

An over-arching MS B and Build Decision for RDP-1 were approved by the MDA in Q4 FY14, and a CD1.1 Fielding Decision and a RDP-2 Build Decision were approved in Q3 FY16. Each subsequent RDP will have a single Build Decision and each CD will have an associated Fielding Decision.

**JOINT WARNING & REPORTING NETWORK (JWARN)**

JWARN Increment 2 utilizes the JROC's "IT Box" construct for software requirements management and development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and away from an incremental delivery approach. This effort is being executed under a Cost-Plus-Award Term Incentive structure to gain maximum benefit to the Government in maintaining the fielded baseline and future software capability development and was awarded under a full and open competition Request for Proposal (RFP).

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

The JWARN Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

**SOFTWARE SUPPORT ACTIVITY (SSA)**

The SSA provides enterprise-wide services and coordination across all CBDP programs that contain data or software, or are capable of linking to the Global Information Grid (GIG). The SSA facilitates interoperability, integration, and supportability of existing and developing IT and National Security Systems (NSS). This will be followed by coordination to facilitate the concepts of interoperability, integration and supportability of enterprise-wide services. Next follows work with user communities to develop and demonstrate enterprise-wide common architectures, products and services. The SSA will support the application of the enterprise-wide architectures, products and services into the programs, with verification of compliance with the defined products and services.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
BSP - SW S - software - BSP software development	FFRDC	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	6.954	Mar 2016	8.101	Mar 2017	5.319	Mar 2018	-		5.319	Continuing	Continuing	0.000
CBRN IS - SW S - software - integration with BSP, JEM, JWARN	MIPR	Various : Various	0.000	0.000		2.339	Dec 2016	1.394	Dec 2017	-		1.394	Continuing	Continuing	0.000
JEM - SW SB - Increment 2 - Hazard Prediction Model Development and Integration	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	10.521	1.005	Apr 2016	1.051	Apr 2017	1.676	Apr 2018	-		1.676	Continuing	Continuing	0.000
JWARN - SW S - Increments 1&2 - Software Development	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	1.601	2.609	Feb 2016	3.196	Feb 2017	4.475	Feb 2018	-		4.475	Continuing	Continuing	0.000
SSA - SW S - CBRN Data Model	C/CPAF	Various : Various	6.343	0.615	Mar 2016	0.687	Mar 2017	0.749	Mar 2018	-		0.749	Continuing	Continuing	0.000
<b>Subtotal</b>			18.465	11.183		15.374		13.613		-		13.613	-	-	0.000

<b>Support (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
CBRN IS - ES S - Support Costs - Cybersecurity and IA updates, architecture documentation	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	0.000	0.000		1.300	Dec 2016	0.774	Dec 2017	-		0.774	Continuing	Continuing	0.000
SSA - ES S - Support Costs	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	7.837	0.549	Nov 2015	0.649	Dec 2016	0.707	Dec 2017	-		0.707	Continuing	Continuing	0.000
<b>Subtotal</b>			7.837	0.549		1.949		1.481		-		1.481	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BSP - DTE S - Software	MIPR	Various : Various	0.000	0.998	Dec 2015	0.984	Mar 2017	0.991	Dec 2017	-		0.991	Continuing	Continuing	0.000
BSP - OTE S - Software - MOT&E	MIPR	Various : Various	0.000	1.135	Dec 2015	1.486	Mar 2017	1.091	Dec 2017	-		1.091	Continuing	Continuing	0.000
CBRN IS - OTE S - Operational Test - service-specific testing, joint test	MIPR	Various : Various	0.000	0.000		1.500	Dec 2016	0.894	Dec 2017	-		0.894	Continuing	Continuing	0.000
JEM - DTE SB - Increment 2 - Hazard Prediction Model Development Test	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	8.665	0.677	Nov 2015	0.656	Dec 2016	2.205	Dec 2017	-		2.205	Continuing	Continuing	0.000
JEM - OTHT C - Increment 2 - OT&E Hazard Prediction Modeling software	MIPR	Various : Various	1.050	1.037	Nov 2015	0.539	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - DTE S - Increment 2 - Completed Development Test and Evaluation of JWARN INC 2 in support of JWARN INC 2 IOT&E	MIPR	Various : Various	0.153	0.697	Dec 2015	0.329	Dec 2016	1.571	Dec 2017	-		1.571	Continuing	Continuing	0.000
JWARN - OTE S - Increment 2 - Multi-service Operational Test and Evaluation of JWARN INC 2 software	MIPR	Various : Various	0.462	0.789	Dec 2015	0.809	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
SSA - DTE S - Test and Evaluation	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.195	0.461	Nov 2015	0.514	Dec 2016	0.561	Dec 2017	-		0.561	Continuing	Continuing	0.000
<b>Subtotal</b>			13.525	5.794		6.817		7.313		-		7.313	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BSP - PM/MS S - Program Management	Various	Various : Various	0.000	0.867	Dec 2015	1.003	Dec 2016	1.114	Dec 2017	-		1.114	Continuing	Continuing	0.000
CBRN IS - PM/MS S - Program Management - Planning, Programming, and Budeting	MIPR	Various : Various	0.000	0.000		0.500	Dec 2016	0.299	Dec 2017	-		0.299	Continuing	Continuing	0.000
JEM - PM/MS S - Program Office - Planning and Programming	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	6.390	0.833	Nov 2015	0.674	Dec 2016	0.774	Dec 2017	-		0.774	Continuing	Continuing	0.000
JWARN - PM/MS C - Increment 2 - Program Management Support	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	0.351	0.574	Nov 2015	0.735	Dec 2016	0.787	Dec 2017	-		0.787	Continuing	Continuing	0.000
SSA - PM/MS S - Management Services	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	2.683	0.243	Dec 2015	0.271	Dec 2016	0.296	Dec 2017	-		0.296	Continuing	Continuing	0.000
<b>Subtotal</b>			9.424	2.517		3.183		3.270		-		3.270	-	-	0.000
<b>Project Cost Totals</b>			49.251	20.043		27.323		25.677		-		25.677	-	-	-

**Remarks**



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: FY 2018 Chemical and Biological Defense Program</b>			<b>Date: May 2017</b>
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)	

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BSP - RDP-1																												
BSP - Initial Operational Test and Evaluation - RDP 1																												
BSP - IOC																												
BSP - CSG BD 5																												
BSP - CSG BD 6																												
BSP - CSG BD 7																												
BSP - CSG BD 8																												
BSP - CSG BD 9																												
BSP - CSG BD 10																												
BSP - Final Operational Test and Evaluation - RDP 1																												
CBRN IS - Technical Guidance																												
CBRN IS - Standardization																												
CBRN IS - Product Development																												
CBRN IS - Operational Assessments																												
JEM Increment 2 - RDP 2 / Build Decision 2																												
JEM Increment 2 - BD 2																												
JEM Increment 2 - FD 1																												
JEM Increment 2 - RDP 3																												
JEM Increment 2 - IOC Standalone																												
JEM Increment 2 - BD 3																												
JEM Increment 2 - FD 2																												
JEM Increment 2 - RDP 4																												
JEM Increment 2 - FD 3																												

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JEM Increment 2 - FD 4																												
JEM Increment 2 - C2 Integration Development Test	■	■																										
JEM Increment 2 - Govt DT / OT / V&V	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JEM Increment 2 - BD 4																												
JWARN Increment 2 - RDP 2 Approval	■																											
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JWARN Increment 2 - RDP 3 Approval																												
JWARN Increment 2 - Modernization and Update																												
JWARN Increment 2 - RDP 2 Build Decision																												
JWARN Increment 2 - RDP 3 Build Decision																												
JWARN Increment 2 - Fielding Decision 1																												
JWARN Increment 2 - Fielding Decision 2																												
JWARN Increment 2 - Fielding Decision 3																												
JWARN Increment 2 - IOC RDP 1																												
JWARN Increment 2 - IOC RDP 2																												
JWARN Increment 2 - IOC RDP 3																												
JWARN Increment 2 - RDP 4 Approval																												
SSA - Provide Integration and Test, M&S, VV&A Certification and Accreditation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.																																
SSA - Provide Net-Centric Assessment and assist programs with implementation of policy																																
SSA - Develop and provide CBRN Data Model implementation guidance, including reference implementations																																
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface																																
SSA - Provide Configuration Management Services for Common User Products and Services																																

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSP - RDP-1	1	2016	3	2020
BSP - Initial Operational Test and Evaluation - RDP 1	2	2016	2	2016
BSP - IOC	3	2016	3	2016
BSP - CSG BD 5	1	2017	1	2017
BSP - CSG BD 6	3	2017	3	2017
BSP - CSG BD 7	1	2018	1	2018
BSP - CSG BD 8	3	2018	3	2018
BSP - CSG BD 9	1	2019	1	2019
BSP - CSG BD 10	3	2019	3	2019
BSP - Final Operational Test and Evaluation - RDP 1	2	2020	2	2020
CBRN IS - Technical Guidance	1	2017	2	2020
CBRN IS - Standardization	1	2017	2	2020
CBRN IS - Product Development	1	2017	2	2020
CBRN IS - Operational Assessments	1	2017	2	2020
JEM Increment 2 - RDP 2 / Build Decision 2	1	2016	1	2016
JEM Increment 2 - BD 2	3	2016	3	2016
JEM Increment 2 - FD 1	3	2016	3	2016
JEM Increment 2 - RDP 3	2	2016	2	2016
JEM Increment 2 - IOC Standalone	3	2016	3	2016
JEM Increment 2 - BD 3	1	2018	1	2018
JEM Increment 2 - FD 2	3	2017	3	2017
JEM Increment 2 - RDP 4	1	2017	1	2017

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> IS5 / INFORMATION SYSTEMS (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
JEM Increment 2 - FD 3	4	2017	4	2017
JEM Increment 2 - FD 4	4	2018	4	2018
JEM Increment 2 - C2 Integration Development Test	1	2016	2	2016
JEM Increment 2 - Govt DT / OT / V&V	1	2016	4	2020
JEM Increment 2 - BD 4	1	2018	1	2018
JWARN Increment 2 - RDP 2 Approval	1	2016	1	2016
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2016	2	2021
JWARN Increment 2 - RDP 3 Approval	1	2017	1	2017
JWARN Increment 2 - Modernization and Update	3	2016	4	2021
JWARN Increment 2 - RDP 2 Build Decision	3	2016	3	2016
JWARN Increment 2 - RDP 3 Build Decision	1	2017	1	2017
JWARN Increment 2 - Fielding Decision 1	2	2017	2	2017
JWARN Increment 2 - Fielding Decision 2	1	2018	1	2018
JWARN Increment 2 - Fielding Decision 3	1	2019	1	2019
JWARN Increment 2 - IOC RDP 1	3	2017	3	2017
JWARN Increment 2 - IOC RDP 2	2	2018	2	2018
JWARN Increment 2 - IOC RDP 3	2	2020	2	2020
JWARN Increment 2 - RDP 4 Approval	3	2021	3	2021
SSA - Provide Integration and Test, M&S, VV&A Certification and Accreditation	1	2016	4	2022
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2016	4	2022
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2016	4	2022
SSA - Provide Net-Centric Assessment and assist programs with implementation of policy	1	2016	4	2022

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> IS5 / <i>INFORMATION SYSTEMS (EMD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
SSA - Develop and provide CBRN Data Model implementation guidance, including reference implementations	1	2016	4	2022
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2016	4	2022
SSA - Provide Configuration Management Services for Common User Products and Services	1	2016	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MB5: MEDICAL BIOLOGICAL DEFENSE (EMD)	-	80.412	106.223	136.553	-	136.553	170.330	196.813	183.836	160.146	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project includes medical countermeasures, development of reagents, assays, diagnostic equipment, biosurveillance and supporting efforts.

The Critical Reagent Program's (CRP) strategy establishes a core research and development capability by developing biological threat agent reference materials (strains, antigens, antibodies and nucleic acids) and detection/diagnostic assays for biothreat agent detection. These reagents/assays are leveraged across multiple programs to meet the requirements of the Warfighter and Joint biological defense systems and support the biological defense community. Through the Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) initiative, the CRP will use a systematic approach to the introduction of new materials and information into MCM development. The CRP program will transition to the Defense Biological Products Assurance Program (DBPAP) in FY18.

The Emerging Infectious Diseases Therapeutics (EID Tx) program is developing and will deliver a Food and Drug Administration (FDA) approved, broad-spectrum medical countermeasure to the Warfighter for protection against naturally occurring or biologically engineered viruses. The first indication being pursued is influenza due to a clear and established FDA regulatory approval pathway. The product in development failed during phase 3 clinical trials as a result the flu effort is being terminated. The development of a broad spectrum medical countermeasure will continue under the Antiviral Therapeutic program.

The Hemorrhagic Fever Virus (HFV) MCS Acquisition Program develops medical countermeasures (MCMs), using high threat, extremely lethal Biological Warfare Agents (BWAs) of the Filoviridae family agents as a model system. Medical countermeasures will be advanced through the Food and Drug Administration (FDA) licensure/approval via the FDA 'Animal Rule', which allows for the demonstration of efficacy in relevant animal model(s) when human testing is not ethically feasible. HFV will also conduct animal model development and refinement as needed to support the pivotal animal efficacy testing required under the FDA 'Animal Rule'. Completion of Phase I trials, animal model development, and manufacturing scale up were the focus of the TMRR phase. FDA approval for Filovirus therapeutics are expected following completion of the EMD phase. Beginning in FY17, the work will be continued under the Antiviral Therapeutic Countermeasures program.

The Antiviral Therapeutic Program (AV TX) will combine the efforts of the Emerging Infectious Diseases Therapeutics and the Hemorrhagic Fever Virus Program into a consolidated effort to develop and deliver FDA approved antiviral therapeutics for the warfighter, beginning in FY17. Drug products will be developed targeting the pathogens on the biological warfare threat lists, such as Ebola. This includes viruses of interest from the following families: Filoviridae, Alphaviridae, Arenaviridae, Bunyaviridae, and Flaviviridae. Developed antiviral therapeutics will be employed after suspected or confirmed exposure to the relevant threat agents and AV TX MCMs will ameliorate the effect of threat agents to the warfighter. In the event of a natural occurring outbreak, antiviral therapeutics can be provided to ensure freedom of operation.

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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The Agile Medical Paradigm (AMP) is the CBDP's strategic framework to accelerate the delivery of MCMs. To achieve this goal the DOD is establishing a medical countermeasures platform (MCMPT) capability. The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. Efforts will focus on establishing a rapid response capability through rationale design to support identification of viral targets and development of protein expression processes that will support rapid response.

The NGDS is an evolutionary acquisition family of systems to provide increments of capability over time across many echelons of the Combat Health Support System. The mission of the NGDS is to provide Chemical, biological and radiological (CBR) threat, and infectious disease identification and FDA-cleared diagnostics to inform individual patient treatment and CBR situational awareness and disease surveillance. NGDS Increment 1 will significantly improve diagnostic capabilities for deployable combat health support units (Role 3) while also improving operational suitability and affordability. The term "Role" is used to describe the stratification of the four tiers in which medical support is organized, on a progressive basis, to conduct treatment, evacuation, resupply, and functions essential to the maintenance of the health of the force. Role 3 support is normally provided at Division or Service equivalent level and includes specialist laboratory resources. NGDS Increment 2 will complement NGDS Increment 1 by developing diagnostics for unmet biological pathogen and toxin threats, chemical and radiological exposures, and to provide capability to lower echelons of care.

The DoD provides for the development of vaccines that are directed against validated biological warfare (BW) weapons to include bacteria, viruses, and toxins of biological origin. Effective medical countermeasures are urgently needed to negate the threat of these BW agents. Vaccines have been identified as the most efficient countermeasure against the validated threat of BW weapons. Products under development in this budget item include Recombinant Botulinum A/B, Plague, and Filovirus vaccines. Efforts to be conducted during the Engineering Manufacturing Development (EMD) Phase include the development of large scale manufacturing process and validation of that process, nonclinical studies, demonstration of manufacturing consistency, and expanded clinical human safety studies. The results of these efforts, and those conducted during the EMD phase, will be used to submit a Biologic License Application (BLA) to the Food and Drug Administration (FDA) for product licensure. To evaluate vaccine effectiveness, pivotal animal studies will be conducted concurrently with the Phase 3 clinical trial to satisfy the requirements of the FDA's "Animal Rule". The DoD anticipates that the FDA will approve these products for the Recombinant Botulinum A/B, Plague, and Filovirus programs using the Animal Rule, which allows for the demonstration of efficacy in relevant animal model(s). Upon FDA licensure, the product will transition to full-scale licensed production.

The DoD also has the mission to maintain Investigational New Drug (IND) vaccines in Good Manufacturing Practice (GMP) storage and to conduct the periodic potency and sterility testing of these materials to support submissions to the FDA. These IND vaccines will be used to provide additional levels of protection to laboratory workers in the Special Immunizations Program (SIP) conducting research on these diseases.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) MCMPT	-	-	0.500
<b>FY 2018 Plans:</b> Initiate establishment of advanced platform technologies within the DoD's Advanced Development Manufacturing (ADM) facility.			
<b>Title:</b> 2) NGDS 2	1.910	1.600	-
<b>FY 2016 Accomplishments:</b>			



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Completed risk reduction activities for Man Portable Diagnostic System. <b>FY 2017 Plans:</b> Continue clinical trials for CBR multiplex lateral flow immunoassays				
<b>Title:</b> 3) NGDS 2 <b>FY 2016 Accomplishments:</b> Initiated system development and demonstration for CBRN NGDS Increment 2 man-portable diagnostic platform instrument. <b>FY 2017 Plans:</b> Continue system development and demonstration for CBR NGDS Increment 2 diagnostic platform instrument. <b>FY 2018 Plans:</b> Continue Engineering & Manufacturing Development on required system engineering activities and complete operational test activities for Man Portable Diagnostic System.		2.864	7.971	9.174
<b>Title:</b> 4) NGDS 2 <b>FY 2017 Plans:</b> Purchase lateral flow immunoassays to support clinical trials.		-	0.400	-
<b>Title:</b> 5) NGDS 2 <b>FY 2017 Plans:</b> Initiate clinical efforts to expand Test-mate diagnostic capability for Chemical agent threats.		-	2.200	-
<b>Title:</b> 6) NGDS 2 In Vitro Diagnostic Assay Development and Maturation <b>FY 2018 Plans:</b> Optimize In Vitro Diagnostic assays for NGDS 2 man-portable diagnostic system.		-	-	6.612
<b>Title:</b> 7) VAC BOT - Recombinant Botulinum Vaccine <b>Description:</b> Manufacturing Technology Transfer <b>FY 2016 Accomplishments:</b> Completed manufacturing of AgA engineering campaign. Initiated Bot Antigen A cGMP campaign and Bot Antigen B engineering campaign at new Contract Manufacturing Organization. <b>FY 2017 Plans:</b>		12.740	4.000	4.500

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>Complete the cGMP runs for the AgB manufacturing process and complete the Process Performance Qualification (PPQ) manufacturing runs for both serotypes. Initiate compounding and engineering runs for drug product fill-finish(vialing/fill and finish bottling the product)of drug substance.</p> <p><b>FY 2018 Plans:</b> Initiate and complete cGMP and PPQ runs for drug product fill-finish(vialing/fill and finish bottling the product)of drug substance in preparation for the Phase 3 Clinical Trial.</p>				
<p><b>Title:</b> 8) VAC BOT - Recombinant Botulinum Vaccine</p> <p><b>Description:</b> Manufacturing/Analytical Technology Transfer</p> <p><b>FY 2016 Accomplishments:</b> Continued non-clinical comparability studies to bridge newly manufactured drug substance and product to material made prior to the tech transfer. Submitted comparability protocol to the FDA and conducted technical data review with FDA (Type C meeting). Initiated efforts for the development of the Chemistry Manufacturing and Controls (CMC) submission to the FDA.</p> <p><b>FY 2017 Plans:</b> Continue drug substance comparability efforts. Manufacturing focus on drug product fill finish activities in anticipation of the Phase 3 Clinical Trial.</p> <p><b>FY 2018 Plans:</b> Continue drug substance comparability efforts. Initiate and completion of drug product GMP con lots and testing in preparation for the Phase 3 Clinical Trial.</p>		6.232	2.652	31.629
<p><b>Title:</b> 9) VAC BOT</p> <p><b>Description:</b> Program Management</p> <p><b>FY 2016 Accomplishments:</b> Continued to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, and technical support.</p> <p><b>FY 2017 Plans:</b> Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, and technical support.</p> <p><b>FY 2018 Plans:</b></p>		2.274	2.000	2.010

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, and technical support.				
<b>Title:</b> 10) VAC FILO		-	4.300	-
<b>FY 2017 Plans:</b> Initiate process development and manufacturing scale up.				
<b>Title:</b> 11) VAC FILO		-	2.052	-
<b>FY 2017 Plans:</b> Initiate nonclinical testing and assay qualification.				
<b>Title:</b> 12) VAC PLG		6.682	9.348	14.001
<b>FY 2016 Accomplishments:</b> Completed Animal efficacy studies. Send Pivotal Animal Efficacy Study design and Reproductive Toxicity Study design to FDA for approval. Continue requirements for safeguarding biological select agents and toxins.				
<b>FY 2017 Plans:</b> Initiate pivotal animal efficacy and reproductive toxicity studies to meet FDA licensure (start up activities, procure animals and vaccinate). Continue ongoing requirements for safeguarding biological select agents and toxins.				
<b>FY 2018 Plans:</b> Continue pivotal animal efficacy and reproductive toxicity studies to meet FDA licensure (in life activities, and immunological testing). Continue ongoing requirements for safeguarding biological select agents and toxins.				
<b>Title:</b> 13) VAC PLG		1.298	24.212	19.854
<b>FY 2016 Accomplishments:</b> Completed Fill-Finish Operations for release of Final Drug Product (FDP). Downselect, from among candidate contractors, a single contractor to conduct Phase 3 human clinical trial. Hold End-of-Phase 2 meeting with FDA.				
<b>FY 2017 Plans:</b> Initiate in-life portion of Phase 3 clinical trial to evaluate expanded safety and efficacy.				
<b>FY 2018 Plans:</b> Continued in-life portions of the Phase 3 clinical trial to evaluate expanded safety and efficacy.				
<b>Title:</b> 14) VAC PLG		1.500	9.586	11.501
<b>FY 2016 Accomplishments:</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Completed and finalize adjustments to production, Fill/Finish operations and PCA results after receipt of FDA guidance. <b>FY 2017 Plans:</b> Submit FDP documentation to FDA. Complete final studies on the PCA. Prepare for BLA submission to the FDA. <b>FY 2018 Plans:</b> Initiate warm base manufacturing to prepare for FDA pre-approval inspections.				
<b>Title:</b> 15) VAC PLG <b>FY 2016 Accomplishments:</b> Continued to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight, and technical support. <b>FY 2017 Plans:</b> Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight and technical support. <b>FY 2018 Plans:</b> Continue to provide strategic/tactical planning, Government systems engineering, program/financial management, costing, technology assessment, contracting, scheduling, acquisition oversight and technical support.		5.200	3.304	2.001
<b>Title:</b> 16) VAC SIP <b>FY 2016 Accomplishments:</b> Continued storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program. <b>FY 2017 Plans:</b> Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program. <b>FY 2018 Plans:</b> Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program.		2.722	2.688	2.703
<b>Title:</b> 17) CRP <b>FY 2016 Accomplishments:</b>		2.477	1.753	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued development/expansion of biological select agents reference materials to known and emerging threats. <b>FY 2017 Plans:</b> Continue development/expansion of biological select agents reference materials to known and emerging threats.				
<b>Title:</b> 18) CRP <b>FY 2016 Accomplishments:</b> Continued development of immunoassays and nucleic acid based genomic assays to support fielded and developmental systems. <b>FY 2017 Plans:</b> Continue development of immunoassays and nucleic acid based genomic assays to support fielded and developmental systems.		1.769	1.514	-
<b>Title:</b> 19) CRP <b>FY 2016 Accomplishments:</b> Continued QA/QC testing to encompass the transition and fielding of biological detection assays. <b>FY 2017 Plans:</b> Continue QA/QC testing to encompass the transition and fielding of biological detection assays.		1.149	0.745	-
<b>Title:</b> 20) CRP <b>FY 2016 Accomplishments:</b> Continued to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continue quality actions throughout to maintain the quality managed systems. <b>FY 2017 Plans:</b> Continue to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continue quality actions throughout to maintain the quality managed systems.		1.327	1.251	-
<b>Title:</b> 21) CRP <b>FY 2016 Accomplishments:</b> Continued development of prototypes/information for strains contained in Unified Culture Collection. <b>FY 2017 Plans:</b> Continue development of prototypes/information for strains contained in Unified Culture Collection.		2.122	1.894	-
<b>Title:</b> 22) DBPAP - Select Agent Reference Materials <b>FY 2018 Plans:</b>		-	-	2.473

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue (CRP) development/expansion of biological select agents reference materials to known and emerging threats.				
<b>Title:</b> 23) DBPAP - Development of Immunoassays <b>FY 2018 Plans:</b> Continue (CRP) development of immunoassays and nucleic acid based genomic assays to support fielded and developmental systems.		-	-	1.765
<b>Title:</b> 24) DBPAP - QA/QC Testing <b>FY 2018 Plans:</b> Continue (CRP) QA/QC testing to encompass the transition and fielding of biological detection assays.		-	-	1.147
<b>Title:</b> 25) DBPAP - Accreditation Audits <b>FY 2018 Plans:</b> Continue (CRP) to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continue quality actions throughout to maintain the quality managed systems.		-	-	1.323
<b>Title:</b> 26) DBPAP - Unified Culture Collection <b>FY 2018 Plans:</b> Continue (CRP) development of prototypes/information for strains contained in Unified Culture Collection.		-	-	2.118
<b>Title:</b> 27) EID TX <b>FY 2016 Accomplishments:</b> Completed analysis of data for all FDA required clinical trials, including the 1,716 patient Phase 3 clinical study. Developed and delivered FDA clinical study reports.		10.835	-	-
<b>Title:</b> 28) EID TX <b>FY 2016 Accomplishments:</b> Completed compilation of all data for the product. <b>FY 2017 Plans:</b> Submit influenza product and gain FDA approval.		0.636	3.856	-
<b>Title:</b> 29) HFV <b>FY 2016 Accomplishments:</b> Executed contract close out activities		10.131	-	-
<b>Title:</b> 30) HFV		6.544	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b><i>FY 2016 Accomplishments:</i></b> Initiated Joint Mobile Emerging Infectious Disease Clinical Capability (JMEDICC).			
<b><i>Title:</i></b> 31) AV TX - Candidate 1	-	18.897	-
<b><i>FY 2017 Plans:</i></b> Complete source selection activities and award contract for Filovirus countermeasure. Initiate pilot and pivotal aerosol efficacy studies in a BSL 4, under GLP conditions. Initiate manufacturing process optimization activities for scale-up to meet DoD production requirements. Validation of assays to support GMP manufacture. Continue pivotal animal efficacy studies via aerosol and parenteral routes of challenge in non-human primates for Filo countermeasure. Continue manufacturing process optimization activities. Manufacture of GMP compliant drug substance and drug product.			
<b><i>Title:</i></b> 32) AV TX Candidate 1	-	-	1.100
<b><i>FY 2018 Plans:</i></b> Clinical: Conduct clinical trials studying efficacy to include continued resistance monitoring.			
<b><i>Title:</i></b> 33) AV TX Candidate 1	-	-	22.142
<b><i>FY 2018 Plans:</i></b> Non-clinical: Continue efficacy studies with Non Human Primates infected with Ebola virus.			
<b>Accomplishments/Planned Programs Subtotals</b>	80.412	106.223	136.553

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB7: MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)	8.541	7.145	11.950	-	11.950	9.850	3.728	6.060	6.532	Continuing	Continuing
• JM8788: NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)	3.300	7.395	6.938	-	6.938	5.842	2.919	4.826	2.644	Continuing	Continuing
• JX0005: DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)	0.185	0.185	0.183	-	0.183	0.183	0.183	0.182	0.182	Continuing	Continuing
• JX0210: DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)	1.005	1.005	0.995	-	0.995	0.975	0.972	0.874	0.788	Continuing	Continuing

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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**Remarks**

**D. Acquisition Strategy**

MCM PLATFORM TECHNOLOGIES (MCMPT)

The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. BA5 Efforts will focus on establishing advanced platform technologies within the DoD's Advanced Development Manufacturing (ADM) facility and evaluating that capability through nonclinical and clinical testing. The early stage efforts (BA4) are to develop standardized design capabilities to support a rapid response. Once established, future programs will be able to leverage this capability for the development of specific medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority through the medical OTA consortium.

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

The NGDS Increment 1 program has a streamlined MS A to MS C - Limited Deployment acquisition strategy. The NGDS Increment 1 is intended to replace the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17.

The NGDS Increment 2 program addresses CBRN agents and concepts of employment (COEs) that the NGDS Increment 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBRN agent diagnostics across multiple echelons of care. NGDS Increment 2 will employ a system of systems approach to bridge identified capability gaps for man-portable diagnostics, complementary bench top diagnostics, chemical diagnostics, and handheld disposable diagnostics. NGDS Increment 2 will initiate engineering development of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. Separate decisions will be utilized to establish programs of record for bench top, chemical and handheld disposable diagnostic capability development, based on individual determinations of technology maturity to meet user requirements.

BOTULINUM VACCINE (VAC BOT)

The Prime System Contractor (Dynport Vaccine Company/DVC LLC, Frederick MD) will function as the FDA regulatory sponsor and will perform all ancillary, regulatory, quality assurance, and data management as required by the FDA. The current budget supports development through FDA licensure of a recombinant bivalent (A and B) botulinum vaccine. Other serotypes will be developed through an evolutionary approach, as funding becomes available. The Advanced Component Development and Prototypes (ACD&P) phase included the manufacture of candidate current Good Manufacturing Practices (cGMP) lots, animal safety testing, and initial clinical trials. During this phase, the vaccine was evaluated for safety and immunogenicity in a small human clinical trial (Phase 1). During the Engineering Manufacturing Development (EMD) Phase, the prime contractor stabilized the vaccine formulation, validated the manufacturing process and testing protocols, optimized the delivery systems and manufactured consistency lots. Phase 2 clinical trials were performed and provided additional safety data. The evaluation of efficacy in pivotal animal



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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studies to satisfy FDA requirements for the Animal Rule has been completed. The remaining efforts to be conducted during the EMD phase include the Phase 3 clinical trial to demonstrate safety in an expanded volunteer population. The Low Rate Initial Production (LRIP) decision will be conducted after the manufacturing process has been validated and consistency lots have been produced. A Biologics License Application (BLA) is submitted to the FDA including all clinical, nonclinical, and manufacturing data. The FDA grants licensure to products that are determined to be safe and efficacious.

**FILOVIRUS (VAC FILO)**

The Filovirus Vaccine Program acquisition strategy supports the development of multiple vaccines through the Technology Maturation and Risk Reduction (TMRR) phase that will offer protection against the threat of Ebola and Marburg viruses. During this phase a manufacturing process is developed. This process will be used to produce current Good Manufacturing Practices (cGMP) lots suitable for Phase 1 clinical trials. In addition, animal safety and efficacy studies will be conducted to support an Investigational New Drug (IND) submission to the FDA and conduct Phase 1 clinical trials. These efforts will support a MS B decision and entry into the Engineering, Manufacturing, and Development (EMD) phase. At Milestone B (MS B), the best Marburg vaccine prototype will be selected through a full and open competition to transition to the Engineering and Manufacturing Development (EMD) phase with the delivery of an FDA licensed Marburg vaccine. It is anticipated that the EMD phase contract will be a mix of Cost Plus and Fixed Price. In addition, the program office may leverage the Advanced Development and Manufacturing capability, and other DoD agencies and laboratories to include the United States Army Medical Research Institute of Infectious Diseases (USAMRIID). Following a successful MS B, the program will conduct manufacturing qualification/validation, expanded clinical and nonclinical testing, and assay qualification and validation efforts. These efforts will support the Biological Licensure Application (BLA) submission to the Food and Drug Administration (FDA) and licensure of a Marburg vaccine.

**PLAGUE VACCINE (VAC PLG)**

The Advanced Component Development and Prototypes (ACD&P) phase included the manufacture of candidate current Good Manufacturing Practices (cGMP) lots, animal safety testing, and initial clinical trials. During this phase, the vaccine was evaluated for safety and immunogenicity in a small human clinical trial (Phase 1). In order to reduce technical program risk in the Plague vaccine program, the program office conducted competitive prototyping between a US vaccine candidate and a United Kingdom vaccine candidate. During the 2008 Resource Allocation Decision, the US Plague Vaccine candidate was selected for development through licensure under a Prime System Contract. The Prime System Contractor (Dynport Vaccine Company/DVC LLC, Frederick MD) currently functions as the FDA regulatory sponsor and performs all ancillary, regulatory, quality assurance, and data management as required by the FDA. A Project Arrangement is in place with the United Kingdom and Canada. During the Engineering Manufacturing Development (EMD) Phase, the prime contractor stabilized the vaccine formulation, validated the manufacturing process and testing protocols, optimized the delivery systems and manufactured consistency lots. Phase 2 clinical trials were performed and provided additional safety data. The remaining efforts to be conducted during the EMD phase include the Phase 3 clinical trial to demonstrate safety in an expanded volunteer population and evaluation of efficacy and duration of protection in pivotal animal studies to satisfy FDA requirements for the Animal Rule. The Low Rate Initial Production (LRIP) decision will be conducted after the manufacturing process has been validated and consistency lots have been produced. A Biologics License Application will be submitted to the FDA with all clinical, nonclinical, and manufacturing data. The FDA grants licensure to products that are determined to be safe and efficacious.

**SPECIAL IMMUNIZATION PROGRAM (VAC SIP)**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> MB5 / <i>MEDICAL BIOLOGICAL DEFENSE (EMD)</i>
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The SIP effort Life Cycle Cost Estimate (LCCE) manages the IND vaccines which provide additional protection to laboratory workers performing research on the infectious agents for Tularemia, Eastern Equine Encephalitis (EEE), Western Equine Encephalitis (WEE), Venezuelan Equine Encephalitis (VEE), and Q-Fever. Efforts include Good Manufacturing Practices (GMP) storage and periodic potency testing to support the FDA regulated Investigational New Drug (IND) reporting requirements. This Department of Defense program supports the Federal interagency with this effort, as well as academic and industry partners.

**CRITICAL REAGENTS PROGRAM (CRP)**

The Critical Reagents Program's (CRP) strategy establishes a core research and development capability to develop biological threat agent reference materials (antigens, nucleic acids, and antibodies) and detection and diagnostic assays for biothreat agent detection that shall be used across multiple detection and diagnostic platforms. In addition, this strategy includes a formal, validated advanced development process for transitioning new assays into production and subsequent integration with the appropriate detection/diagnostic platform. This program will transition to the Defense Biological Products Assurance Program (DBPAP) in FY18.

**DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)**

The Defense Biological Products Assurance Program's (DBPAP) strategy establishes a core research and development capability to develop biological threat agent reference materials (antigens, nucleic acids, and antibodies) and detection and diagnostic assays for biothreat agent detection that shall be used across multiple detection and diagnostic platforms. In addition, this strategy includes a formal, validated advanced development process for transitioning new assays into production and subsequent integration with the appropriate detection/diagnostic platform.

**EMERGING INFECTIOUS DISEASES - THERAPUTIC (EID TX)**

The goal of the EID Tx program is to develop a safe and effective MCM against biothreats of interest to the DoD. The first step of the acquisition strategy is to develop an MCM for influenza due to a clear and established FDA regulatory approval pathway. The Phase 2 clinical trial is complete, demonstrating both safety and efficacy in humans. Program was authorized by FDA to move forward at End of Phase 2 meeting on 3 SEP 13. Phase 3 clinical trials for EID Tx against influenza began during 1QFY14. The MCM was unsuccessful in the Phase 3 clinical trials, removing the expectation of FDA approval. In June 2016, the recommendation was made to end the EID - Flu product development contract and transition the program to AV Tx. It was determined that the influenza product, Favipiravir, would not meet contract requirements and program key performance parameters. The FDA informed the sponsor that the product under development did not provide a clinically significant benefit and was unlikely to be approved for the current indication. As a result, the program will package select data while removing all non-essential activities, allowing the contract to end with the current PoP in March 2017. The requirement for a broad-spectrum Antiviral will continue under the AV Tx Program.

**HEMORRHAGIC FEVER VIRUS (HFV)**

In June 2015, TKM-Ebola failed two separate clinical trials for safety and efficacy. Tekmira Pharmaceuticals saw no path forward for the existing product and proposed a complete reformulation of the drug. A concurrence was reached to close out the TKM-Ebola development contract at the end of the base period in January 2016 with all exercised option CLINs also being terminated. This program is being combined with EID - New Indications to form the new Antiviral Program starting in FY17.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
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ANTI-VIRAL THERAPEUTICS (AV TX)

The acquisition strategy combined the HFV and EID TX Program efforts beginning in FY17, into a single program to develop and deliver FDA approved antiviral countermeasures. Independent market research conducted in FY15 identified multiple candidates appropriate for advanced development at varying stages of maturity. A source selection was conducted targeting award in FY16. Candidates selected for entry into the EMD phase of development will be executed under the Antiviral Therapeutic program in FY17. Candidates selected which are appropriate for entry into the TMRR phase will be deferred for award until FY17 when BA4 funding is available to the program. The overall regulatory approach of the program remains to pursue development of products to FDA approval under the Animal Rule. The program will conduct human clinical safety studies, pilot and pivotal animal efficacy, and toxicology studies, required for FDA approval. The performers will submit New Drug Applications/Biologic License Agreements for the therapeutics during the EMD Phase. During the Production and Deployment phase, full rate manufacturing and stockpile production will be pursued. If the FDA mandates post-marketing surveillance studies, they will be conducted during Production and Deployment.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MCMPT - HW S - Establishing Advanced Platform Technologies	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.450	Jan 2018	-		0.450	Continuing	Continuing	0.000
NGDS - HW C - IVD Assay Development and Maturation Activities	Various	TBD : TBD	0.000	0.000		0.000		5.088	Dec 2017	-		5.088	Continuing	Continuing	0.000
NGDS - HW C - Complete assay optimization for multiplex lateral flow immunoassay to support clinical trials	MIPR	TBD : TBD	0.000	0.000		2.000	Nov 2016	0.000	Dec 2017	-		0.000	Continuing	Continuing	0.000
NGDS - HW C - Develop Diagnostic Platform	MIPR	TBD : TBD	0.000	0.000		5.518	Dec 2016	7.060	Dec 2017	-		7.060	Continuing	Continuing	0.000
VAC BOT - HW S - Manufacturing, Validation and Consistency Lot Production	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	6.570	1.400	Dec 2015	2.000	Dec 2016	36.139	Dec 2017	-		36.139	Continuing	Continuing	0.000
VAC BOT - HW S - Manufacturing Tech Transfer	MIPR	Battelle Memorial Institute : Columbus, OH	9.189	3.147	Jan 2016	2.000	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - HW S - Manufacturing Scale Up	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		4.300	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - HW S - Nonclinical & Assay Development	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		2.052	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - HW S - Manufacturing, Validation, and Consistency Lot Production	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	7.855	3.400	Dec 2015	14.638	Dec 2016	19.500	Dec 2017	-		19.500	Continuing	Continuing	0.000
CRP - HW C - Scale-up of Select Biological Threat Agent Reference Materials	MIPR	Various : Various	16.069	1.002	Jun 2016	2.521	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CRP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : Various	12.007	0.615	Jun 2016	1.686	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - HW C - Scale-up of Select Biological Threat Agent Reference Materials	MIPR	Various : Various	0.000	0.000		0.000		2.043	Jun 2018	-		2.043	Continuing	Continuing	0.000
DBPAP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : Various	0.000	0.000		0.000		1.826	Jun 2018	-		1.826	Continuing	Continuing	0.000
EID TX - SW SB - TMT EID FLU	C/CPFF	MediVector Inc. : Boston, MA	203.902	6.569	Dec 2015	2.932	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
HFV - HW S - JMEDICC	MIPR	Various : Various	0.000	3.289	Feb 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 1 - Complete Pivotal Animal Efficacy Studies	C/CPAF	TBD : TBD	0.000	0.000		8.626	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Candidate 1 - Manufacturing Process Optimization and Scale up	C/CPIF	TBD : TBD	0.000	0.000		6.059	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - AV TX Pivotal Animal Efficacy Studies (Non Clinical)	C/FP	Gilead Sciences : San Francisco, CA	0.000	0.000		0.000		17.160	Nov 2017	-		17.160	Continuing	Continuing	0.000
AV TX - AV TX - Pivotal Animal Efficacy Studies (Clinical)	C/FP	Gilead Sciences : San Francisco, CA	0.000	0.000		0.000		0.700	Mar 2018	-		0.700	Continuing	Continuing	0.000
<b>Subtotal</b>			255.592	19.422		54.332		89.966		-		89.966	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGDS - ES C - Studies and WIPT Support	MIPR	Various : Various	0.000	0.200	Jun 2016	0.971	Dec 2016	0.971	Dec 2017	-		0.971	Continuing	Continuing	0.000
VAC BOT - TD/D C - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	18.124	5.850	Dec 2015	1.208	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - TD/D C - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	18.123	1.500	Dec 2015	1.600	Dec 2016	3.000	Dec 2017	-		3.000	Continuing	Continuing	0.000
VAC SIP - Storage and Distribution of Vaccines	SS/FP	Fisher BioServices : Rockville, MD	0.640	0.350	Dec 2015	0.370	Dec 2016	0.400	Dec 2017	-		0.400	Continuing	Continuing	0.000
CRP - ES C - Select Biological Threat Agent Reference Material Support	MIPR	Various : Various	4.814	0.413	Jun 2016	0.800	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
CRP - ES C - Select Biological Threat Agent Reference Material Regulatory/Quality Assurance (QA) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.933	1.180	Jun 2016	0.350	Jun 2017	0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - ES C - Select Biological Threat Agent Reference Material Support	MIPR	Various : Various	0.000	0.000		0.000		0.820	Jun 2018	-		0.820	Continuing	Continuing	0.000
DBPAP - ES C - Select Biological Threat Agent Reference Material Regulatory/Quality Assurance (QA) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		1.280	Jun 2018	-		1.280	Continuing	Continuing	0.000
<b>Subtotal</b>			43.634	9.493		5.299		6.471		-		6.471	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGDS - OTHT C - Test and evaluate interagency	MIPR	TBD : TBD	0.000	0.300	Jun 2016	0.000		0.300	Mar 2018	-		0.300	Continuing	Continuing	0.000
NGDS - OTHT C - Evaluate Test Mate	MIPR	TBD : TBD	0.000	0.000		2.200	Dec 2016	0.000	Dec 2017	-		0.000	Continuing	Continuing	0.000
VAC BOT - DTE C - Clinical Trials - Nonclinical Studies	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	72.910	6.075	Dec 2015	2.500	Dec 2016	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - DTE C - Clinical Trials/Non-Clinical Studies	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	80.979	5.480	Dec 2015	24.212	Dec 2016	22.857	Dec 2017	-		22.857	Continuing	Continuing	0.000
VAC SIP - OTHT C - Potency Testing of Vaccines	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	6.988	2.087	Dec 2015	2.028	Dec 2016	2.003	Dec 2017	-		2.003	Continuing	Continuing	0.000
<b>Subtotal</b>			160.877	13.942		30.940		25.160		-		25.160	-	-	0.000

**Remarks**  
USAMRIID will conduct testing acting as a sub-contractor to TEKMIIRA. TEKMIIRA will receive USAMRIID test data and write the final report.

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MCMPT - PM/MS C - Management	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.050	Jan 2018	-		0.050	Continuing	Continuing	0.000
NGDS - PM/MS S - Product Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	2.374	Dec 2015	0.732	Dec 2016	0.136	Dec 2017	-		0.136	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - PM/MS SB - Product Management Systems Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	1.900	Jun 2016	0.750	Dec 2016	2.231	Dec 2017	-		2.231	Continuing	Continuing	0.000
VAC BOT - PM/MS C - JPM Chemical and Biological Medical Systems (JPM CBMS), Fort Detrick, MD	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	13.234	2.500	Dec 2015	0.944	Dec 2016	2.000	Dec 2017	-		2.000	Continuing	Continuing	0.000
VAC BOT - PM/MS S - Joint Vaccine Acquisition Program Management	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	55.773	2.274	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - PM/MS S - Joint Vaccine Acquisition Program Management Office	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	17.936	1.700	Dec 2015	6.000	Dec 2016	2.000	Dec 2017	-		2.000	Continuing	Continuing	0.000
VAC PLG - PM/MS S - Program Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	35.990	2.600	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC SIP - PM/MS SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.024	0.285	Mar 2016	0.290	Mar 2017	0.300	Mar 2017	-		0.300	Continuing	Continuing	0.000
CRP - PM/MS C - Product Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.736	0.965	Mar 2016	0.800	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
CRP - PM/MS C - Product Management Support #2	SS/FFP	Goldbelt Raven LLC. : Frederick, MD	9.623	1.035	Jun 2016	1.000	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CRP - PM/MS C - Chemical and Biological Medical Systems Office	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.330	3.634	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		1.043	Jan 2018	-		1.043	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Support #2	SS/FFP	Goldbelt Raven LLC. : Frederick, MD	0.000	0.000		0.000		1.123	Feb 2018	-		1.123	Continuing	Continuing	0.000
DBPAP - PM/MS C - Chemical and Biological Medical Systems Office	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.691	Jun 2018	-		0.691	Continuing	Continuing	0.000
EID TX - PM/MS SB - Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	4.024	1.589	Jan 2016	0.610	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
EID TX - PM/MS SB - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	5.633	0.708	Jan 2016	0.083	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
EID TX - PM/MS SB - Management Support #3	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.492	1.451	Jan 2016	0.037	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
EID TX - PM/MS C - Contractor Systems	C/FP	Various : Various	5.907	1.154	Dec 2015	0.194	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering/ Program Management Support															
HFV - PM/MS SB - Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	2.001	7.000	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
HFV - PM/MS SB - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.793	3.035	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
HFV - PM/MS SB - Management Support #3	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	1.959	0.592	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
HFV - PM/MS C - Contractor Systems Engineering/ Program Management Support	C/FP	Various : Various	1.281	2.759	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Candidate 1 - Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		1.314	Jan 2017	1.232	Jan 2018	-		1.232	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Candidate 1 - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		1.001	Jan 2017	1.573	Jan 2018	-		1.573	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Candidate 1 - Management Support #3	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.000	0.000		0.577	Jan 2017	0.602	Jan 2018	-		0.602	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: FY 2018 Chemical and Biological Defense Program</b>		<b>Date: May 2017</b>
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MCMPT - Establishing Advanced Platform Technologies																												
NGDS Increment 2 - EMD Phase																												
NGDS Increment 2 - Man-portable Dx Device EMD																												
NGDS Increment 2 - Chem Dx EMD																												
NGDS Increment 2 - Benchtop EMD - Immunoassay and instrument Intergration																												
VAC BOT - Technology Transfer to New CMO/ Manufacturing & Production of Consistency Lots																												
VAC BOT - Milestone C/LRIP																												
VAC BOT - Phase 3 Clinical Trial (A/B)																												
VAC BOT - Biological Licensure Application (BLA) Submission																												
VAC BOT - Ongoing Manufacturing, Testing Efforts/Regulatory																												
VAC BOT - FDA Licensure																												
VAC BOT - Full Operational Capability (FOC)																												
VAC FILO - Manufacturing Scale Up																												
VAC FILO - Non Clinical Testing & Assay Qualification																												
VAC FILO - Manufacturing Phase 2 Lots																												
VAC FILO - Manufacturing Validation																												
VAC PLG - Consistency Lot Production																												
VAC PLG - Phase 3 Clinical Trial/IND Submission for Consistency Lot Production																												

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
VAC PLG - Non-Clinical Studies Pivotal Animal Efficacy																												
VAC PLG - Milestone C/LRIP																												
VAC PLG - Biological Licensure Application (BLA) Submission																												
VAC PLG - Production - IOC/FOC																												
VAC PLG - FDA Licensure																												
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities																												
CRP - Antibodies for Ten Select Biological Threat Agent Reference Materials																												
CRP - International Task Force (ITF)-6A List Complete																												
CRP - Expand Select Biological Threat Agent Reference Materials																												
CRP - Development of Assays																												
CRP - Development and Implementation of Quality Initiatives, Validation Program, and Systems Engineering, QA/QC testing																												
CRP - Optimization and Development of Nucleic Acid Assays																												
CRP - ISO certification																												
CRP - PCR assay validation																												
CRP - Enabling early warning tools and information exchange																												
CRP - Surveillance capabilities																												
DBPAP - International Task Force (ITF)-6A List Complete																												



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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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**Schedule Details**

Events	Start		End	
	Quarter	Year	Quarter	Year
MCMPT - Establishing Advanced Platform Technologies	2	2018	4	2018
NGDS Increment 2 - EMD Phase	4	2017	4	2022
NGDS Increment 2 - Man-portable Dx Device EMD	4	2017	4	2020
NGDS Increment 2 - Chem Dx EMD	1	2020	1	2021
NGDS Increment 2 - Benchtop EMD - Immunoassay and instrument Intergration	3	2020	2	2022
VAC BOT - Technology Transfer to New CMO/Manufacturing & Production of Consistency Lots	1	2016	4	2017
VAC BOT - Milestone C/LRIP	4	2017	4	2017
VAC BOT - Phase 3 Clinical Trial (A/B)	1	2018	4	2020
VAC BOT - Biological Licensure Application (BLA) Submission	1	2021	1	2021
VAC BOT - Ongoing Manufacturing, Testing Efforts/Regulatory	1	2016	3	2021
VAC BOT - FDA Licensure	4	2021	4	2021
VAC BOT - Full Operational Capability (FOC)	4	2021	4	2021
VAC FILO - Manufacturing Scale Up	2	2020	2	2021
VAC FILO - Non Clinical Testing & Assay Qualification	1	2022	2	2022
VAC FILO - Manufacturing Phase 2 Lots	1	2022	4	2022
VAC FILO - Manufacturing Validation	2	2021	2	2022
VAC PLG - Consistency Lot Production	1	2016	2	2016
VAC PLG - Phase 3 Clinical Trial/IND Submission for Consistency Lot Production	2	2016	3	2020
VAC PLG - Non-Clinical Studies Pivotal Animal Efficacy	4	2016	2	2019
VAC PLG - Milestone C/LRIP	2	2019	2	2019
VAC PLG - Biological Licensure Application (BLA) Submission	2	2020	2	2020

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**Exhibit R-4A, RDT&E Schedule Details: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MB5 / MEDICAL BIOLOGICAL DEFENSE (EMD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
VAC PLG - Production - IOC/FOC	4	2019	1	2021
VAC PLG - FDA Licensure	3	2021	3	2021
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities	1	2016	4	2021
CRP - Antibodies for Ten Select Biological Threat Agent Reference Materials	1	2016	2	2017
CRP - International Task Force (ITF)-6A List Complete	1	2016	2	2017
CRP - Expand Select Biological Threat Agent Reference Materials	1	2016	2	2017
CRP - Development of Assays	1	2016	2	2017
CRP - Development and Implementation of Quality Initiatives, Validation Program, and Systems Engineering, QA/QC testing	1	2016	2	2017
CRP - Optimization and Development of Nucleic Acid Assays	1	2016	2	2017
CRP - ISO certification	1	2016	2	2017
CRP - PCR assay validation	1	2016	2	2017
CRP - Enabling early warning tools and information exchange	1	2016	2	2017
CRP - Surveillance capabilities	1	2016	2	2017
DBPAP - International Task Force (ITF)-6A List Complete	1	2018	1	2022
DBPAP - Expand Select Biological Threat Agent Reference Material	1	2018	1	2022
DBPAP - Development and Implementation of Quality Initiatives	1	2018	1	2022
DBPAP - Optimization and Development of Nucleic Acid Assays	1	2018	1	2022
DBPAP - ISO Certification	1	2018	1	2022
DBPAP - PCR assay validation	1	2018	1	2022
DBPAP - Enabling early warning tools and information exchange	1	2018	1	2022
DBPAP - Surveillance capabilities	1	2018	1	2022
EID TX - Flu Manufacture FDA Required Registration Batches	1	2016	2	2017
HFV - Joint Mobile Emerging Infectious Disease Capability (JMEDICC)	2	2016	4	2016
AV TX - Non Clinical Studies	1	2017	4	2018
AV TX - Clinical Drug Resistance Monitoring	1	2017	4	2018



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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> MB5 / <i>MEDICAL BIOLOGICAL DEFENSE (EMD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
AV TX - Pivotal Animal Efficacy Studies (Monoclonal Antibodies)	1	2019	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MC5: MEDICAL CHEMICAL DEFENSE (EMD)	-	64.773	39.504	47.388	-	47.388	38.499	18.325	16.966	20.491	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides for the development of medical materiel and other medical equipment items necessary to provide an effective capability for medical defense against chemical warfare agent threats facing U.S. forces in the field. This project supports efforts in the Engineering and Manufacturing Development (EMD) phase of the acquisition strategy for prophylactic, pre-treatment, and therapeutic drugs and diagnostic medical devices for the protection, treatment, detection, and medical management of chemical warfare agent exposures. Project provides for the research and development of safety studies, manufacturing scale-up, process validation, drug interaction, performance test, and submission of the Food and Drug Administration (FDA) drug licensure application(s). This program currently includes: (1) Alternative Autoinjector (AUTOINJ), which consists of investigating an FDA approved alternative source(s), beyond the single current DoD source, for autoinjectors that deliver DoD nerve agent antidote and treatment capabilities to the warfighter; mitigates capability fielding and operational readiness risks. This resulted from the manufacturing and quality issues for the Advanced Anticonvulsant System (AAS) program, Midazolam in an autoinjector. (2) Bioscavenger (BSCAV), a new capability, to be used as a prophylaxis against nerve agents; (3) Improved Nerve Agent Treatment System (INATS) an enhanced chemical warfare nerve agent treatment regimen consisting of an improved oxime to replace the current fielded oxime 2-pralidoxime chloride (2-PAM), a centrally acting therapeutic to increase survival, and studies to generate data to support use of pyridostigmine bromide (PB), as a pretreatment for nerve agents in addition to soman; (4) The Advanced Anticonvulsant System (AAS), consists of Midazolam in an autoinjector for treatment of nerve agent induced seizures. Midazolam, injected intramuscularly, will treat traditional nerve agent and non-traditional agent-induced seizures and prevent subsequent neurological damage. Midazolam is more water-soluble than diazepam (the currently fielded medication to control nerve agent-induced seizures) and terminates nerve agent-induced seizures more quickly than diazepam. AAS will not eliminate the need for other protective and therapeutic systems.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) AUTOINJ	-	2.950	3.241
<b>FY 2017 Plans:</b> Initiate manufacturing of autoinjector consistency lots.			
<b>FY 2018 Plans:</b> Continue manufacturing of autoinjector consistency lots.			
<b>Title:</b> 2) AUTOINJ	-	1.980	2.500
<b>FY 2017 Plans:</b> Initiate storage stability and bioequivalency testing.			
<b>FY 2018 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue storage stability and bioequivalency testing for autoinjector.				
<b>Title:</b> 3) AUTOINJ <b>FY 2017 Plans:</b> Coordinate New Drug Application meetings with the FDA. <b>FY 2018 Plans:</b> Initiate FDA preparation, filing, and meetings for single and dual drug autoinjectors.		-	0.218	0.500
<b>Title:</b> 4) AUTOINJ <b>FY 2018 Plans:</b> Initiate prototype development of single and dual drug autoinjector		-	-	2.250
<b>Title:</b> 5) AUTOINJ <b>FY 2018 Plans:</b> Initiate human factors and environmental testing for single and dual drug autoinjectors.		-	-	1.350
<b>Title:</b> 6) AAS <b>FY 2016 Accomplishments:</b> Initiated process qualification of manufacturing system in support of New Drug Application re-submittal to the FDA.		0.800	-	-
<b>Title:</b> 7) AAS <b>FY 2016 Accomplishments:</b> Initiated reverse engineering efforts for the existing 2-PAM autoinjector.		1.000	-	-
<b>Title:</b> 8) BSCAV <b>FY 2016 Accomplishments:</b> Initiated particle characterization in drug product.		7.500	-	-
<b>Title:</b> 9) BSCAV <b>FY 2016 Accomplishments:</b> Initiated assay development for nonclinical toxicity and phase 1 studies.		7.822	-	-
<b>Title:</b> 10) BSCAV <b>FY 2016 Accomplishments:</b>		4.655	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued storage and stability testing of purified product.				
<b>Title:</b> 11) BSCAV		9.296	-	-
<b>FY 2016 Accomplishments:</b> Completed engineering and scale-up manufacturing runs.				
<b>Title:</b> 12) BSCAV		8.496	6.018	4.337
<b>FY 2016 Accomplishments:</b> Initiated pilot nonclinical toxicity and pharmacokinetic (PK) and efficacy studies.				
<b>FY 2017 Plans:</b> Continue pilot nonclinical toxicity and pharmacokinetic (PK) and efficacy studies.				
<b>FY 2018 Plans:</b> Continue pilot nonclinical toxicity and pharmacokinetic (PK) and efficacy studies.				
<b>Title:</b> 13) BSCAV		8.071	8.100	8.505
<b>FY 2016 Accomplishments:</b> Initiated cGMP manufacturing for clinical and nonclinical studies.				
<b>FY 2017 Plans:</b> Continue cGMP manufacturing for clinical and nonclinical studies.				
<b>FY 2018 Plans:</b> Continue cGMP manufacturing for clinical and nonclinical studies.				
<b>Title:</b> 14) BSCAV		-	3.100	3.255
<b>FY 2017 Plans:</b> Initiate phase 1 clinical pharmacokinetic (PK) and safety studies.				
<b>FY 2018 Plans:</b> Continue phase 1 clinical pharmacokinetic (PK) and safety studies.				
<b>Title:</b> 15) BSCAV		8.430	4.600	4.830
<b>FY 2016 Accomplishments:</b> Continued development of a manufacturing process for additional source materials.				
<b>FY 2017 Plans:</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Complete development of a manufacturing process for additional source materials. <b>FY 2018 Plans:</b> Initiate Human Clinical Phase 2/3 Study for expanded safety.				
<b>Title:</b> 16) BSCAV <b>FY 2017 Plans:</b> Initiate nonclinical studies to evaluate drug-drug interactions in small animal models. <b>FY 2018 Plans:</b> Continue nonclinical studies to evaluate drug-drug interactions in small animal models.		-	2.400	2.520
<b>Title:</b> 17) INATS <b>FY 2016 Accomplishments:</b> Continued nonclinical studies to expand indications for pyridostigmine bromide (PB). <b>FY 2017 Plans:</b> Complete nonclinical studies (in guinea pig) to expand indications for pyridostigmine bromide (PB).		1.198	1.500	-
<b>Title:</b> 18) INATS <b>FY 2016 Accomplishments:</b> Completed nonclinical studies to evaluate the efficacy of centrally-acting therapeutics with fielded oxime.		3.203	-	-
<b>Title:</b> 19) INATS <b>FY 2016 Accomplishments:</b> Initiated pilot scale development and final drug product (FDP).		1.483	-	-
<b>Title:</b> 20) INATS <b>FY 2016 Accomplishments:</b> Initiated small-scale current Good Manufacturing Practice (cGMP) efforts and manufacture of clinical trial material. <b>FY 2017 Plans:</b> Complete small-scale centrally acting current Good Manufacturing Practice (cGMP) efforts and manufacture of clinical trial material.		2.819	1.800	-
<b>Title:</b> 21) INATS <b>FY 2017 Plans:</b>		-	3.838	2.294

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Initiate large-scale centrally acting current Good Manufacturing Practice (cGMP) efforts and manufacturing of clinical trial material. <b>FY 2018 Plans:</b> Continue large-scale centrally acting current Good Manufacturing Practice (cGMP) efforts and manufacturing of clinical trial material.			
<b>Title:</b> 22) INATS <b>FY 2017 Plans:</b> Initiate centrally acting phase 1 clinical trial. <b>FY 2018 Plans:</b> Complete centrally acting phase 1 clinical trial.	-	3.000	5.400
<b>Title:</b> 23) INATS <b>FY 2018 Plans:</b> Initiate & complete centrally acting reformulation efforts and bridging studies.	-	-	6.406
<b>Accomplishments/Planned Programs Subtotals</b>	64.773	39.504	47.388

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

<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• JM6677: <i>ADVANCED ANTICONVULSANT SYSTEM (AAS)</i>	0.000	0.000	0.000	-	0.000	0.360	0.360	2.700	2.700	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The Alternative Autoinjector Investigation will identify an alternative source(s) to develop, and provide required and FDA approved autoinjector-delivered nerve agent antidote and treatment capabilities to the services. Currently, a single DoD source provides all of these capabilities. That single source is experiencing manufacturing and quality issues leading to risk that the services may not meet their operational requirements. This effort leverages previous work begun under the Advanced Anticonvulsant System (AAS) autoinjector-delivered product wherein the single manufacturer notified the AAS program office that the FDA had noted manufacturing and quality issues which impacted the AAS program as well as all other DoD autoinjector-delivered nerve agent antidotes and treatments. At that time, the AAS program began investigating alternative sources through the release of a request for Information (RFI). Subsequent to the RFI, the AAS program awarded a task order under an

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> MC5 / <i>MEDICAL CHEMICAL DEFENSE (EMD)</i>
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existing IDIQ contract vehicle to begin the identification efforts. As this issue is well beyond the scope of the AAS program and impacts all developmental and fielded autoinjector-delivered capabilities, the Joint Program Executive Office, Chemical and Biological Defense (JPEO-CBD) approved the strategy to expand the alternative autoinjector effort beyond AAS, thus initiating a new effort benefiting both fielded and developmental capabilities. The JPEO-CBD also approved the management and oversight of the effort via a series of In-Process Reviews (IPRs). The effort will proceed through the submission of a New Drug Application and will culminate with FDA approval of an alternative autoinjector source(s).

**ADVANCED ANTICONVULSANT SYSTEM (AAS)**

The Advanced Anticonvulsant System, consists of Midazolam in an autoinjector for treatment of nerve agent induced seizures. Midazolam, injected intramuscularly, will treat traditional nerve agent and non-traditional agent-induced seizures and prevent subsequent neurological damage. Midazolam is more water-soluble than diazepam (the currently fielded medication to control nerve agent-induced seizures) and terminates nerve agent-induced seizures more quickly than diazepam. AAS will not eliminate the need for other protective and therapeutic systems.

A contractor shall be responsible for conducting activities associated with drug development in a manner consistent with eventual approval by the Food and Drug Administration (FDA). The contractor shall sponsor the drug to the FDA and hold all approvals and/or licenses. During the System Development and Demonstration (SDD) Phase, large scale manufacturing, Phase 2 human clinical safety studies and definitive animal efficacy studies will be conducted. FDA approval of the countermeasure is an exit criterion for the SDD phase. During the Production and Deployment Phase, sufficient quantities of product to meet Initial Operational Capability will be purchased. Subsequent purchases will be made by the Defense Logistics Agency. Any post-marketing surveillance requested by the FDA will be the responsibility of the contractor.

In addition, the program will assess the viability of establishing an alternative manufacturing capability for currently fielded autoinjectors used for therapeutic treatment and medical management of chemical warfare agent exposures.

**BIOSCAVENGER (BSCAV)**

Used a serial evaluation of candidates to achieve competitive prototyping in the Technology Maturation and Risk Reduction phase which culminated in a down-select decision. The Bioscavenger program issued a Request For Proposal (RFP) to select the best value for the government for a prophylaxis to support an initial limited user group. During the System Development and Demonstration (SDD) phase the program will continue to exercise management oversight with system integration support of a commercial partner to ensure that manufacturing of the product is in accordance with Food and Drug Administration (FDA) regulations and guidelines. The RFP for product manufacturing includes options for transition to the Medical Countermeasures Initiative (MCMI) Advanced Development and Manufacturing (ADM) capability. Prior to FDA licensure, a commercial partner will perform a Phase 2 human clinical safety study, definitive animal efficacy studies, and toxicology studies. The system integrator will also develop and manufacture a product formulation and delivery system and will submit a New Drug Application and seek FDA approval. The SDD phase will culminate in FDA licensure of the Bioscavenger. During the Production and Deployment phase, the Bioscavenger program, in conjunction with a commercial partner, will pursue full rate production and conduct any FDA-mandated post-marketing surveillance studies. Concurrently the Bioscavenger program will conduct an

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> MC5 / <i>MEDICAL CHEMICAL DEFENSE (EMD)</i>
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analysis of alternative manufacturing technologies, investigate additional product indications, and pursue an expanded force prophylaxis once alternate technologies have matured.

**IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)**

The INATS' evolutionary Acquisition Strategy has expanded to (1) align all Department of Defense nerve agent therapeutics under it, and to (2) insert a centrally-acting (CA) anticholinergic agent. This strategy employs an incremental approach to provide independent, and more rapid deliveries of oxime, expanded PB indications, and CA capabilities than in a combined treatment regimen delivery. In the Technology Maturation and Risk Reduction (TM&RR) phase, close collaborations will occur with the science/ technology, and user communities to assess technical viability, capability delivery options, and to refine operational concepts; the Government will be the systems integrator overseeing the conduct of oxime and centrally acting formulation development efforts, nonclinical toxicology and efficacy studies, clinical safety studies, and efficacy studies addressing the PB indication. In the Engineering and Manufacturing Development (EMD) phase for the oxime and CA each capability, the Government will engage with commercial partner(s) to ensure that INATS development and manufacture is in accordance with Food and Drug Administration (FDA) regulations and guidelines; the commercial partner(s) will perform a Phase 2 human clinical safety study, nonclinical toxicology studies and definitive animal efficacy studies; the commercial partner(s) will also oversee the manufacture of improved oxime and CA formulations and delivery system that is stable under operationally relevant temperatures. The Government will submit a New Drug Application and seek FDA approval for the INATS product. In the Production and Deployment (P&D) Phase, the Government will pursue full-rate and stockpile production, conduct any FDA mandated post-marketing surveillance studies, and will transfer contracting/ logistical responsibilities to the Defense Logistics Agency (DLA) while remaining to monitor program performance through disposal as the life-cycle manager.

**E. Performance Metrics**

N/A



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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUTOINJ - HW S - Autoinjector - Manufacturing of Consistency Lots	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		2.840	Dec 2016	3.000	Dec 2017	-		3.000	Continuing	Continuing	0.000
AUTOINJ - HW C - Prototype Development	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		2.125	Oct 2017	-		2.125	Continuing	Continuing	0.000
AAS - SW C - Resubmission of NDA	C/CPFF	Meridian Medical Technologies Inc. : Columbia, MD	0.830	0.800	Jun 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AAS - HW S - Alternative Autoinjector	C/CPFF	Battelle Memorial Institute : Columbus, OH	8.154	1.000	Jul 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - HW S - cGMP Manufacturing and Process Validation	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	14.643	7.400	Feb 2016	6.883	Jan 2017	7.055	Jan 2018	-		7.055	Continuing	Continuing	0.000
BSCAV-P - SW S - Engineering and Scale up Manufacturing	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.600	8.131	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - HW S - Evaluation of Alternative Source Material	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	5.200	7.900	Aug 2016	3.750	Dec 2016	3.844	Jan 2018	-		3.844	Continuing	Continuing	0.000
INATS - HW C - Pilot Scale Development of Drug Product	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	2.842	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - cGMP Efforts and Manufacture of Material	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	2.665	Apr 2016	4.980	Dec 2016	2.163	Dec 2017	-		2.163	Continuing	Continuing	0.000
INATS - HW C - Reformulation & Bridging Studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		5.135	Oct 2017	-		5.135	Continuing	Continuing	0.000
<b>Subtotal</b>			29.427	30.738		18.453		23.322		-		23.322	-	-	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUTOINJ - TD/D S - Autoinjector - FDA NDA coordination	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.190	Jun 2017	0.363	Oct 2017	-		0.363	Continuing	Continuing	0.000
INATS - ILS S - Regulatory Support	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.429	0.235	Jun 2016	0.260	Jun 2017	0.275	Jun 2018	-		0.275	Continuing	Continuing	0.000
<b>Subtotal</b>			0.429	0.235		0.450		0.638		-		0.638	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUTOINJ - DTE S - Autoinjector - Stability Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		1.760	Jun 2017	2.215	Oct 2017	-		2.215	Continuing	Continuing	0.000
AUTOINJ - DTE C - Human Factors Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		1.200	Oct 2017	-		1.200	Continuing	Continuing	0.000
BSCAV-P - DTE C - Particle Characterization in drug product	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	7.100	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - DTE C - Assay development for nonclinical toxicity and phase 1 studies	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	7.450	Jul 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - OTHT S - Stability Testing	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	4.584	4.058	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - OTHT S - Phase 1 PK and Safety Studies	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	0.000	Mar 2016	2.310	Jan 2017	2.326	Jan 2018	-		2.326	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
BSCAV-P - OTHT S - Nonclinical Studies to evaluate drug-drug interactions	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	0.000		1.870	Jan 2017	1.924	Jan 2018	-		1.924	Continuing	Continuing	0.000
BSCAV-P - OTHT S - Pilot Nonclinical PK Efficacy Studies	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	7.663	Dec 2015	5.340	Jan 2017	4.152	Jan 2018	-		4.152	Continuing	Continuing	0.000
INATS - DTE S - Nonclinical Studies for PB	C/CPFF	Battelle Memorial Institute : Columbus, OH	3.894	0.706	Jan 2016	1.140	Jan 2017	0.000		-		0.000	Continuing	Continuing	0.000
INATS - DTE S - Centrally Acting Nonclinical Studies - Oxime / 2-PAM	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.650	1.095	Dec 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - DTE S - INATS - Centrally Acting Phase 1 Trial	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		2.240	Dec 2016	4.797	Dec 2017	-		4.797	Continuing	Continuing	0.000
<b>Subtotal</b>			9.128	28.072		14.660		16.614		-		16.614	-	-	0.000

<b>Management Services (\$ in Millions)</b>				<b>FY 2016</b>		<b>FY 2017</b>		<b>FY 2018 Base</b>		<b>FY 2018 OCO</b>		<b>FY 2018 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
AUTOINJ - PM/MS S - Autoinjector - Program Support	PO	JPM Chem/Bio Medical Systems (JPM CBMS) : Fort Detrick, MD	0.000	0.000		0.358	Dec 2016	0.938	Dec 2017	-		0.938	Continuing	Continuing	0.000
BSCAV-P - PM/MS S - MCS Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.848	1.438	Mar 2016	1.010	Mar 2017	1.031	Mar 2018	-		1.031	Continuing	Continuing	0.000
BSCAV-P - PM/MS S - Product Management Support	C/FFP	Various : Various	3.052	1.270	Jun 2016	1.190	Jun 2017	1.210	Jun 2018	-		1.210	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BSCAV-P - PM/MS S - Product Management Support #2	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.036	0.360	Mar 2016	0.240	Mar 2017	0.240	Mar 2018	-		0.240	Continuing	Continuing	0.000
BSCAV-P - PM/MS C - Program Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	2.725	1.500	Mar 2016	1.625	Mar 2017	1.665	Mar 2018	-		1.665	Continuing	Continuing	0.000
INATS - PM/MS S - Product Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.300	0.160	Dec 2015	0.165	Dec 2016	0.170	Dec 2017	-		0.170	Continuing	Continuing	0.000
INATS - PM/MS S - Program Management Support	Allot	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.470	0.480	Mar 2016	0.528	Mar 2017	0.630	Mar 2017	-		0.630	Continuing	Continuing	0.000
INATS - PM/MS S - Product Management Support #2	C/FFP	Various : Various	0.465	0.520	Jun 2016	0.825	Jun 2017	0.930	Jun 2017	-		0.930	Continuing	Continuing	0.000
<b>Subtotal</b>			10.896	5.728		5.941		6.814		-		6.814	-	-	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	49.880	64.773	39.504	47.388	-	47.388	-	-	-

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AUTOINJ - Autoinjector - Manufacturing of Consistency Lots																												
AUTOINJ - Autoinjector - Storage and Bioequivalency Testing																												
AUTOINJ - Autoinjector - FDA Coordination																												
AUTOINJ - NDA Submission																												
AUTOINJ - FDA Approval																												
AUTOINJ - Prototype Development																												
AUTOINJ - Human Factors Testing																												
AAS - ALT-AI Reverse Engineering																												
AAS - AAS NDA Re-submittal																												
BSCAV - Alternate Source Material Evaluation																												
BSCAV - Storage and Stability Testing of Purified Product																												
BSCAV - Engineering and Scale up Manufacturing																												
BSCAV - Nonclinical Toxicity PK and LD50 Studies																												
BSCAV - cGMP Manufacturing																												
BSCAV - Phase 1 Pilot PK and Clinical Studies																												
BSCAV - Milestone C																												
BSCAV - Phase 2 Clinical Trial																												
BSCAV - Assay development for nonclinical studies																												
BSCAV - Particle characterization in drug product																												

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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
INATS - Centrally Acting Formulation Development	██████████																											
INATS - Nonclinical Studies - Centrally Acting	████████████████████																											
INATS - PB Studies	████████████████████				████████████████████																							
INATS - Manufacture of Clinical Trial Material	████████████████████				████████████████████				████████████████████																			
INATS - Milestone B					██████																							
INATS - Initiate Phase 2 Clinical Trial									████████████████████																			
INATS - Initiate pivotal animal efficacy study									████████████████████																			
INATS - Centrally Acting phase 1					████████████████████																							

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> MC5 / MEDICAL CHEMICAL DEFENSE (EMD)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AUTOINJ - Autoinjector - Manufacturing of Consistency Lots	1	2017	1	2019
AUTOINJ - Autoinjector - Storage and Bioequivalency Testing	3	2017	4	2022
AUTOINJ - Autoinjector - FDA Coordination	3	2017	4	2022
AUTOINJ - NDA Submission	1	2018	1	2018
AUTOINJ - FDA Approval	1	2019	1	2019
AUTOINJ - Prototype Development	1	2018	3	2022
AUTOINJ - Human Factors Testing	1	2018	3	2022
AAS - ALT-AI Reverse Engineering	4	2016	4	2017
AAS - AAS NDA Re-submittal	3	2016	2	2017
BSCAV - Alternate Source Material Evaluation	1	2016	2	2017
BSCAV - Storage and Stability Testing of Purified Product	1	2016	2	2019
BSCAV - Engineering and Scale up Manufacturing	1	2016	3	2016
BSCAV - Nonclinical Toxicity PK and LD50 Studies	1	2016	1	2019
BSCAV - cGMP Manufacturing	3	2016	2	2019
BSCAV - Phase 1 Pilot PK and Clinical Studies	1	2017	1	2019
BSCAV - Milestone C	1	2019	1	2019
BSCAV - Phase 2 Clinical Trial	2	2018	4	2019
BSCAV - Assay development for nonclinical studies	4	2016	3	2017
BSCAV - Particle characterization in drug product	2	2016	2	2017
INATS - Centrally Acting Formulation Development	1	2016	3	2016
INATS - Nonclinical Studies - Centrally Acting	1	2016	3	2017
INATS - PB Studies	1	2016	3	2018

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>	<b>Project (Number/Name)</b> MC5 / <i>MEDICAL CHEMICAL DEFENSE (EMD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
INATS - Manufacture of Clinical Trial Material	1	2016	2	2020
INATS - Milestone B	3	2017	3	2017
INATS - Initiate Phase 2 Clinical Trial	1	2018	1	2019
INATS - Initiate pivotal animal efficacy study	1	2018	1	2019
INATS - Centrally Acting phase 1	1	2017	1	2018



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)				<b>Project (Number/Name)</b> TE5 / TEST & EVALUATION (EMD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TE5: TEST & EVALUATION (EMD)	-	6.021	6.119	9.548	-	9.548	9.056	7.788	7.990	7.394	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This funding supports the Chemical Biological Defense Portfolio (CBDP) Test Equipment, Strategy, and Support (TESS) efforts TESS provides test infrastructure products for testing and evaluating chemical and biological defense systems throughout the life cycle acquisition process. TESS test infrastructure products are aligned in two groups to include: (1) Laboratory; (2) Field.

(1) Laboratory: The products for this area are the Non-Traditional Agent Defense Test System (NTADTS) and improvements to the Dynamic Test Chamber (DTC). The NTADTS provides a new capability to conduct chemical defense testing against current and emerging threat agents. The NTADTS supports testing of decontamination, collective protection, individual protection, and contamination avoidance products. The DTC provides a new capability for testing chemical point detection systems against chemical warfare agents in various environmental conditions. The CBD acquisition programs supported are Dismounted Reconnaissance Sets Kits and Outfits (DR SKO), Next Generation Chemical Detector (NGCD), Joint Sensitive Equipment Wipes (JSEW), and Common Analytical Laboratory System (CALs). Future efforts will include the development of test methods and methodologies for additional classes of agents.

(2) Field: The products for this area are Test Grid, Safari Test Grid, Joint Ambient Breeze Tunnel (JABT) and Active Standoff Chamber (ASC). The Test Grid effort provides a fully instrumented grid for chemical and biological simulant field test capabilities that integrate referee systems; dissemination equipment; real-time cloud tracking capability; meteorological equipment; a wireless network; and a Data Management System (DMS) software to track and display the simulant cloud; and provide status of all of the equipment in the network at Dugway Proving Ground (DPG). The Safari Test Grid is an all-inclusive mobile management service functioning wirelessly, capable of integrating, controlling, commanding and managing all assets required to conduct chemical and biological (CB) tests at any Major Range Test Facility Base (MRTFB). It provides algorithms and graphical user interfaces for automating real-time visualization, raw data, computation, hosts data collection and indefinite storage that can go to any MRTFB for CB Testing. The JABT and ASC improvements will provide a tech refresh to existing infrastructure and allow establishment of test data correlation between laboratory-tunnels-field for test results. The CBD acquisition programs supported are the Joint Expeditionary Collective Protection (JECp), Next Generation Chemical Detector (NGCD), Joint Biological Tactical Detection System (JBTDs), and the Joint USFK Point and Integrated Threat Recognition (JUPITR) Enhanced Capability Demonstration (ECD).

Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) PD TESS - Dynamic Test Chamber (DTC)	0.150	-	-
<b>FY 2016 Accomplishments:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> TE5 / TEST & EVALUATION (EMD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Initiated upgrade for Next Generation Chemical Detector (NGCD) use.				
<b>Title:</b> 2) PD TESS - Program Management		1.216	-	2.700
<b>FY 2016 Accomplishments:</b> Continued Government Integrated Product Team program management, systems engineering and IPT support.				
<b>FY 2018 Plans:</b> Continue Government Integrated Product Team program management, systems engineering and IPT support.				
<b>Title:</b> 3) PD TESS - Non-Traditional Agent Defense Test System (NTADTS)		1.600	2.260	2.800
<b>FY 2016 Accomplishments:</b> Transitioned additional validated test subsystems to the CB T&E community.				
<b>FY 2017 Plans:</b> Continue to transition additional validated test subsystems to the CB T&E community.				
<b>FY 2018 Plans:</b> Continue to transition additional validated test subsystems to the CB T&E community.				
<b>Title:</b> 4) PD TESS- Tech Refresh		-	-	1.948
<b>FY 2018 Plans:</b> Initiate upgrades for obsolescence of referee equipment and fixtures.				
<b>Title:</b> 5) PD TESS - Test Grid		3.055	1.100	-
<b>FY 2016 Accomplishments:</b> Completed verification and validation of test capability upgrade IOC and transition of capabilities to CB T&E community.				
<b>FY 2017 Plans:</b> Perform software maintenance upgrades. Provide support management reach back. Support refresher training on system operation.				
<b>Title:</b> 6) PD TESS - Joint Ambient Breeze Tunnel (JABT)		-	0.715	0.900
<b>FY 2017 Plans:</b> Conduct V&V Testing on upgrades and transition.				
<b>FY 2018 Plans:</b> Complete upgrades and transition.				
<b>Title:</b> 7) PD TESS - Active Standoff Chamber - (ASC)		-	0.715	1.200

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604384BP / CHEMICAL/BIOLOGICAL DEFENSE (EMD)	<b>Project (Number/Name)</b> TE5 / TEST & EVALUATION (EMD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>FY 2017 Plans:</b> Conduct V&V Testing on upgrades and transition.			
<b>FY 2018 Plans:</b> Complete upgrades and transition.			
<b>Title:</b> 8) PD TESS - Safari Test Grid	-	1.329	-
<b>FY 2017 Plans:</b> Conduct V&V Testing. Integrate sensors. Transition MTI to DPG for network dissemination and referee devices.			
<b>Accomplishments/Planned Programs Subtotals</b>	6.021	6.119	9.548

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• TE7: TEST & EVALUATION (OP SYS DEV)	2.681	2.594	6.605	-	6.605	6.318	5.416	5.733	5.733	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
TEST EQUIPMENT, STRATEGY & SUPPORT (PD TESS)

TESS efforts are supported through competitive contract actions, academia, and other Government agencies. Infrastructure solutions will leverage commercially available systems to provide state-of-the-art capabilities that address current and future CBDP test and evaluation needs.

**E. Performance Metrics**  
N/A

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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (RDT&amp;E MGT SUPPORT)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	100.269	85.754	104.348	-	104.348	103.954	102.283	104.232	104.530	Continuing	Continuing
DT6: <i>JOINT DOCTRINE AND TRAINING SUPPORT (RDT&amp;E MGT SUPPORT)</i>	-	1.550	3.185	3.600	-	3.600	3.600	3.600	3.600	3.600	Continuing	Continuing
DW6: <i>MAJOR RANGE AND TEST FACILITY BASE (MRTFB)</i>	-	50.777	50.639	53.164	-	53.164	52.862	53.039	53.673	53.673	Continuing	Continuing
LS6: <i>LABORATORY SUPPORT</i>	-	9.607	9.339	13.864	-	13.864	13.655	12.949	13.202	13.202	Continuing	Continuing
MS6: <i>RDT&amp;E MGT SUPPORT</i>	-	37.035	21.212	32.220	-	32.220	32.337	31.195	32.257	32.555	Continuing	Continuing
O49: <i>JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)</i>	-	1.300	1.379	1.500	-	1.500	1.500	1.500	1.500	1.500	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This Budget Activity includes research, development, testing and evaluation management support for the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP).

Program Element 0605384BP supports Joint Doctrine and Training (Project DT6), sustains the technical test capability at West Desert Test Center (WDTC) (Project DW6); sustains the core Department of Defense (DoD) Science and Technology (S&T) laboratory infrastructure (Project LS6), provides for program management and financial management support (Project MS6), and supports the Joint Concepts, Studies, and Analysis (JCSA) program (Project O49).

The Joint Training and Doctrine Support (DT6) project supports the development of Joint Doctrine and Tactics, Techniques, and Procedures (TTPs) for developing CB defense systems. This project also supports CB modeling and simulation to support the Warfighter.

The Major Range and Test Facility Base (MRTFB) is a set of test installations, facilities, and ranges which are regarded as "national assets". These assets are sized, operated, and maintained primarily for DoD test and evaluation missions. However, the MRTFB facilities and ranges are also available to commercial and other users on a reimbursable basis. WDTC is designated as the primary element of the MRTFB to primarily conduct CB Defense test and evaluation. The DW6 Project provides operating support to WDTC and BTB-ECBC, also part of the MRTFB, to ensure that DoD test customers are only charged direct costs of testing and that overhead expenses are centrally funded. It finances the required institutional test operating costs. Institutional test operating costs include institutional civilian and contractor labor; repair and maintenance of test instrumentation, equipment, and facilities; and replacement of test equipment.

The Laboratory Support (LS6) project includes laboratory infrastructure to maintain and enhance DoD infrastructure capabilities to counter an expanding threat space, exploit advances in technology; and develop and transition CB defense equipment and countermeasures to the Warfighter.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program Date: May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (RDT&amp;E MGT SUPPORT)</i>
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The management support (MS6) project, provides management support for the DoD CBDP to allow program overview and integration of overall medical and non-medical programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)), through the Deputy Assistant Secretary of Defense for Chemical Biological Defense Programs (DATSD(CBD)); funds management by the Defense Threat Reduction Agency (DTRA); Development, coordination, and approval of joint CBRND requirements, management of multi-service and joint CBRND doctrine, tactics, techniques and procedures; training, leader development, education, exercises, and development of the CBDP Program Objective Memorandum (POM) by the Joint Requirements Office; Joint RDA planning, input to the Annual Report to Congress and Program Objective Memorandum (POM) development by the Program Analysis and Integration Office (PAIO); review of Joint plans and the consolidated CB Defense POM Strategy by Army in its Executive Agent role.

The management support project also includes the Test and Evaluation (T&E) Executive mission to establish test infrastructure investment strategy and adequate testing for Developmental Testing (DT) and Operational Testing (OT) of Department of Defense (DoD) Chemical Biological Defense (CBD) systems and components throughout the systems' acquisition life cycle, as required in the RDA Plan under the Joint Test Infrastructure Working Group (JTIWG) program. The JTIWG program includes T&E Early Involvement, test threat planning, Fielded Equipment Assessments, T&E studies, and T&E Standards planning and development to support testing the CBD systems for all services to include radiological, nuclear, medical T&E efforts.

The Joint Concepts, Studies, and Analysis (JCSA) program (Project O49) project supports the planning, conduct, evaluation, and reporting on Joint tests (for other than developmental hardware) and accomplishment of operational research assessments in support of requirements received from the Services and the Combatant Commanders for already fielded equipment and systems.

This Budget Activity also provides for Program Element 0605502BP, which supports the Small Business Innovative Research (SBIR) program. The overall objective of the CBD SBIR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a CB environment using passive and active means as deterrents. These technologies include CB detection; information assessment (identification, modeling, and intelligence); contamination avoidance; and protection of both individual soldiers and equipment.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification: FY 2018 Chemical and Biological Defense Program</b>	<b>Date: May 2017</b>
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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (RDT&amp;E MGT SUPPORT)</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	102.238	85.754	117.960	-	117.960
Current President's Budget	100.269	85.754	104.348	-	104.348
Total Adjustments	-1.969	0.000	-13.612	-	-13.612
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-1.969	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-13.612	-	-13.612

**Change Summary Explanation**

Funding: FY18 - Adjustments due to underexecution and fact-of-life changes (\$13M).

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)				<b>Project (Number/Name)</b> DT6 / JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DT6: JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)	-	1.550	3.185	3.600	-	3.600	3.600	3.600	3.600	3.600	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The activities of this project directly support the Joint Service CB defense program; in particular, the development of Joint Chemical, Biological, Radiological, and Nuclear (CBRN) defense capability requirements and the improvement of CBRN defense related doctrine, education, training, and awareness at the Joint and Service levels. This effort provides for: (1) Development, coordination, and integration of Joint CBRN defense capability requirements; (2) Development/revision of medical and non-medical CBRN defense Multi-Service Tactics, Techniques, and Procedures (MTTP) and development/revision of Joint Doctrine and Tactics, Techniques, and Procedures (JTTP); (3) The CBDP Joint Senior Leader Course (JSLC); (4) Assistance in correcting training and doctrine deficiencies covered in the lessons learned process, combat operations, capability development studies and Department of Defense Inspector General (DODIG) and Government Accountability Office (GAO) reports and; (5) Support of current and planned CBRN defense studies, analysis, training, exercises, and war games; determine overlaps, duplication, and shortfalls; and build and execute programs to correct shortfalls in all aspects of CBRN defense across all DoD mission areas.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) JRO DT	1.550	3.185	3.600
<p><b>Description:</b> The purpose of this requirement is to provide technical and subject matter expert (SME) support in the areas of: related Chemical, Biological, Radiological, and Nuclear Defense (CBRND)/Countering Weapons of Mass Destruction (CWMD); Joint and Multi-Service doctrine development; Joint and Service training, leadership development, education, and exercises.</p> <p>Specifically, support is needed to:</p> <ol style="list-style-type: none"> <li>1. Conduct technical reviews of Joint and Multi-service CBRN Defense/CWMD doctrinal materials and develop CBRND/CWMD related MTTP manuals.</li> <li>2. Plan and conduct CBRN defense/CWMD Joint Professional Military Education (JPME).</li> <li>3. Provide CBRN defense/CWMD planning, execution and SME support to Combatant Command (CCMD) and Joint Task Force (JTF) level exercises.</li> <li>4. Conduct staff and leader CBRN defense/CWMD training for CCMD and JTF level commands.</li> </ol> <p>Provides support to the National Defense University (NDU) Center for the Study of Weapons of Mass Destruction (WMD) to support their efforts as the Chairman's focal point for CWMD JPME.</p>			



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> DT6 / JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
<p><b><i>FY 2016 Accomplishments:</i></b> Supported Joint and Multi-service doctrine development. This includes preparation of various Joint publications which then inform MTTPs. Supported COCOM scenario development and controller/evaluator training by providing SMEs to exercises. Supported training efforts at various Joint Senior Leadership schools.</p> <p><b><i>FY 2017 Plans:</i></b> Support Joint and Multi-service doctrine development. This includes preparation of various Joint publications which then inform MTTPs. JRO will continue to support COCOM scenario development and controller/evaluator training by providing SMEs to exercises. JRO will continue to support training efforts at various Joint Senior Leadership schools.</p> <p><b><i>FY 2018 Plans:</i></b> Support Joint and Multi-service doctrine development. This includes preparation of various Joint publications which then inform MTTPs. JRO will continue to support COCOM scenario development and controller/evaluator training by providing SMEs to exercises. JRO will continue to support training efforts at various Joint Senior Leadership schools.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	1.550	3.185	3.600

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)				<b>Project (Number/Name)</b> DW6 / MAJOR RANGE AND TEST FACILITY BASE (MRTFB)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DW6: MAJOR RANGE AND TEST FACILITY BASE (MRTFB)	-	50.777	50.639	53.164	-	53.164	52.862	53.039	53.673	53.673	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Project provides the technical and operational capability for testing Department of Defense (DoD) Chemical and Biological (CB) defense materiel, equipment, and systems from concept through production to include associated special operations Tactics, Techniques and Procedures Development (TTPD) activities at West Desert Test Center (WDTC), and the Biological Test Branch of the Edgewood Chemical and Biological Center (BTB-ECBC), both part of the Major Range and Test Facility Base (MRTFB) located at Dugway Proving Ground (DPG). Project provides overhead (institutional) funding required to operate WDTC and BTB-ECBC in compliance with Section 232 of the National Defense Authorization Act (NDAA) for FY03 (Public Law 107-314 - December 2002).

WDTC and BTB-ECBC are the reliance center for all DoD CB defense testing and provide the United States' only combined range, chamber, toxic chemical lab, and bio-safety level-3 (BSL-3) test facility. Total institutional test operating costs are to be provided by the OSD Chemical and Biological Defense Program IAW Program Budget Decision 250 (1996).

WDTC and BTB-ECBC use state-of-the-art chemical and life sciences test facilities and test chambers to perform CB defense testing of protective gear, decontamination systems, detectors, equipment, and non-materiel CB defense solutions while maintaining safety, security, and surety of chemical agents and biological pathogens. WDTC also provides test ranges, to include fully instrumented outdoor ranges, for TTPD activities and testing with simulants that can be correlated to the laboratory testing with live agents to ensure reliable and repeatable data is generated to support acquisition decisions of CB defense equipment.

Secretary of the Army has been directed to conduct additional research addressing existing gaps in scientific knowledge encompassing the Biological Select Agents and Toxins (BSAT) Program. The transition of the Bio-Test Branch (BTB) to Edgewood Chemical Biological Center (ECBC) will enable the DoD BSAT Biosafety Program to meet end to end enterprise tracking, reporting, and auditability requirements within an approved Governance, Risks, and Compliance framework. The laboratory commanders and directors are best able to identify potential risk through the use of local risk assessments and are responsible to promote cultures of safety and responsibility. Direct liaison with and oversight by the EA-RO will ensure laboratory directors or MRTFB commander are empowered and supported in their operational environment. The ultimate responsibility for the safe and secure receipt, storage, handling, shipment and transfer of BSAT resides with the laboratory director or MRTFB commander in accordance with Army, Navy, Air Force, and Federal policies and regulations. The implementation of a structured BSAT Biosafety Program includes clear standards and procedures, policy and regulations, peer review, quality control, accountability and oversight, adequate resources and infrastructure, and continuous process improvement. Through these means employees and members of the public are protected against the hazards associated with BSAT.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) BTB TEST	-	-	4.188

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> DW6 / MAJOR RANGE AND TEST FACILITY BASE (MRTFB)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>FY 2018 Plans:</b> Maintain BTB-ECBC, MRTFB technical test capability and operations to include institutional civilian labor costs. These civilian personnel will ensure the safe and efficient operations of the MRTFB and include safety, security, resource management, surety operations, range control, environmental oversight, workload management, and training. This represents the civilian labor and MRTFB operating costs required to support operations, which cannot be directly tied to a single test customer.</p>				
<p><b>Title:</b> 2) BTB TEST</p> <p><b>FY 2018 Plans:</b> Provide dedicated and specially trained, 24-hour, support staff who operate and maintain all critical control systems, such as, test specific heating, ventilation, and air conditioning (HVAC) systems and decontamination systems within Life Sciences Test Facility (LSTF) Complex</p>		-	-	0.700
<p><b>Title:</b> 3) BTB TEST</p> <p><b>FY 2018 Plans:</b> Provides for ongoing sustainment of existing test instrumentation and equipment at BTB-ECBC, in support of their operations. Support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems.</p>		-	-	0.800
<p><b>Title:</b> 4) BTB TEST</p> <p><b>FY 2018 Plans:</b> Support the BTB-ECBC defense mission by funding contractor labor overhead costs. This is the institutional cost of providing contractual effort to this MRTFB including chemical and biological analysis, field support, planning, and report documentation. Will provide the additional support through contractual efforts to support variable workload rates and address capacity shortfalls created by civilian authorization limits.</p>		-	-	0.600
<p><b>Title:</b> 5) WDTC, MRTFB</p> <p><b>FY 2016 Accomplishments:</b> Maintained WDTC/BTB-ECBC technical test capability and operations that included institutional civilian labor costs. These civilian personnel ensured the safe and efficient operations of the MRTFB and included safety, security, resource management, surety operations, range control, environmental oversight, workload management, and training. This represented the civilian labor and MRTFB operating costs required to support operations, which cannot be directly tied to a single test customer.</p> <p><b>FY 2017 Plans:</b> Will maintain WDTC/BTB-ECBC technical test capability and operations to include institutional civilian labor costs. These civilian personnel will ensure the safe and efficient operations of the MRTFB and include safety, security, resource management, surety</p>		29.491	24.525	24.504

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> DW6 / MAJOR RANGE AND TEST FACILITY BASE (MRTFB)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>operations, range control, environmental oversight, workload management, and training. This represents the civilian labor and MRTFB operating costs required to support operations, which cannot be directly tied to a single test customer.</p> <p><b>FY 2018 Plans:</b> Will maintain WDTC technical test capability and operations to include institutional civilian labor costs. These civilian personnel will ensure the safe and efficient operations of the MRTFB and include safety, security, resource management, surety operations, range control, environmental oversight, workload management, and training. This represents the civilian labor and MRTFB operating costs required to support operations, which cannot be directly tied to a single test customer.</p>				
<p><b>Title:</b> 6) WDTC, MRTFB</p> <p><b>FY 2016 Accomplishments:</b> Provided for ongoing sustainment of existing test instrumentation and equipment at WDTC/BTB-ECBC, in support of their operations. Supported annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems.</p> <p><b>FY 2017 Plans:</b> Provide for ongoing sustainment of existing test instrumentation and equipment at WDTC/BTB-ECBC, in support of their operations. Support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems.</p> <p><b>FY 2018 Plans:</b> Provide for ongoing sustainment of existing test instrumentation and equipment at WDTC, in support of their operations. Support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems.</p>		12.492	10.340	5.828
<p><b>Title:</b> 7) WDTC, MRTFB</p> <p><b>FY 2016 Accomplishments:</b> Provided WDTC/BTB-ECBC with a dedicated and specially trained, 24-hour, support staff who operated and maintained all critical control systems, such as, HVAC systems and decontamination systems within WDTC's Materiel Test Facility (MTF), Combined Chemical Test Facility (CCTF), and Life Sciences Test Facility (LSTF) Complex.</p> <p><b>FY 2017 Plans:</b> Will provide WDTC/BTB-ECBC with a dedicated and specially trained, 24-hour, support staff who operate and maintain all critical control systems, such as, test specific HVAC systems and decontamination systems within WDTC's MTF, CCTF, and LSTF Complex.</p> <p><b>FY 2018 Plans:</b></p>		1.954	1.985	2.016

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> DW6 / MAJOR RANGE AND TEST FACILITY BASE (MRTFB)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Will provide WDTC with a dedicated and specially trained, 24-hour, support staff who operate and maintain all critical control systems, such as, test specific HVAC systems and decontamination systems within WDTC's MTF, and CCTF.				
<b>Title:</b> 8) WDTC, MRTFB		5.865	12.846	13.508
<b>FY 2016 Accomplishments:</b> Supported the WDTC/BTB-ECBC defense mission by funding contractor labor overhead costs. This is the institutional cost of providing contractual effort to this MRTFB including chemical and biological analysis, field support, planning, and report documentation.				
<b>FY 2017 Plans:</b> Will support the WDTC/BTB-ECBC defense mission by funding contractor labor overhead costs. This is the institutional cost of providing contractual effort to this MRTFB including chemical and biological analysis, field support, planning, and report documentation. Will provide the additional support through contractual efforts to support variable workload rates and address capacity shortfalls created by civilian authorization limits.				
<b>FY 2018 Plans:</b> Will support the WDTC defense mission by funding contractor labor overhead costs. This is the institutional cost of providing contractual effort to this MRTFB including chemical and biological analysis, field support, planning, and report documentation. Will provide the additional support through contractual efforts to support variable workload rates and address capacity shortfalls created by civilian authorization limits.				
<b>Title:</b> 9) NON-TRADITIONAL AGENT (NTA) TEST		0.975	0.943	1.020
<b>FY 2016 Accomplishments:</b> Continued the verification and validation efforts of infrastructure improvements for programs of record testing. Implemented sourcing capability for other than Class 1 compounds. Maintained operational readiness of test infrastructure, instrumentation, and equipment. Adapted current test procedures to compounds other than Class 1.				
<b>FY 2017 Plans:</b> Will maintain synthesis capability of Class 1 NTA compounds and other NTA classes in support of program of record test and evaluation. Will develop NTA test methods for uniform materials and protective masks. Will develop chemical dissemination and challenge monitoring methods for other NTA classes.				
<b>FY 2018 Plans:</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> DW6 / MAJOR RANGE AND TEST FACILITY BASE (MRTFB)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Will maintain synthesis capability of Class 1 NTA compounds and other NTA classes in support of program of record test and evaluation. Will develop NTA test methods for uniform materials and protective masks. Will develop chemical dissemination and challenge monitoring methods for other NTA classes.			
<b>Accomplishments/Planned Programs Subtotals</b>	50.777	50.639	53.164

**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:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> LS6 / LABORATORY SUPPORT
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
LS6: LABORATORY SUPPORT	-	9.607	9.339	13.864	-	13.864	13.655	12.949	13.202	13.202	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project (LS6/Laboratory Support) provides for the sustainment and modernization of the DoD laboratory infrastructure capabilities to counter an expanding threat space, exploit advances in technology, and develop and transition chemical and biological (CB) defense equipment and countermeasures to the Warfighter. This laboratory infrastructure project upgrades key systems to the current state-of-the-art capabilities. Key systems include: gas filters, mechanical/electrical, fume hoods, duct work and structural systems. Provides for the initial equipment outfitting of new facilities. Ensures that the necessary surety operations can be conducted effectively and safely in support of Chemical and Biological Defense Program (CBDP) RDT&E programs. As a force multiplier, this project will provide more robust capabilities to the CBDP and ensure continuity of operations and environmental compliance.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) LABINF - Edgewood Chemical Biological Center Surety Facility Sustainment	8.710	8.839	12.264
<b>FY 2016 Accomplishments:</b> Performed general facility sustainment and modernization in key surety facilities that support the Chemical Biological Defense Program (CBDP). Provided for gas filter maintenance and changeout, sustainment of critical laboratory systems (fume hoods, exhaust systems, control systems, electrical/mechanical systems, plumbing, emergency backup power), and modernization of key chemical and biological surety laboratories.			
<b>FY 2017 Plans:</b> Perform general facility sustainment and modernization in key surety facilities that support the CBDP. Provides for gas filter maintenance and change out, sustainment of critical laboratory systems (fume hoods, exhaust systems, control systems, electrical/mechanical systems, plumbing, emergency backup power), and modernization of key chemical and biological surety laboratories.			
<b>FY 2018 Plans:</b> Perform general facility sustainment and modernization in key surety facilities that support the CBDP. Provides for gas filter maintenance and change out, sustainment of critical laboratory systems (fume hoods, exhaust systems, control systems, electrical/mechanical systems, plumbing, emergency backup power), and modernization of key chemical and biological surety laboratories. Modernization efforts include bringing laboratories up to state of the art standards by completing the following: toxic lab demolition, done IAW environmental law and standards, installing new stainless steel bench top fume hoods with security			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> LS6 / LABORATORY SUPPORT
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
sash, new case work for existing fume hoods, new case work with acid and flammable cabinets, new epoxy coated floors and walls, new energy efficient security windows, and upgrades to the electrical systems.			
<b>Title:</b> 2) LABINF - USAMRIID/USAMRICD Infrastructure Support	0.897	0.500	1.600
<b>FY 2016 Accomplishments:</b> Provided laboratory infrastructure support to laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at the U.S. Army Medical Research Institute for Infectious Diseases and the U.S. Army Medical Research Institute for Chemical Defense.			
<b>FY 2017 Plans:</b> Provide laboratory infrastructure support to laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at the U.S. Army Medical Research Institute for Infectious Diseases and the U.S. Army Medical Research Institute for Chemical Defense.			
<b>FY 2018 Plans:</b> Continue to provide laboratory infrastructure support to laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at the U.S. Army Medical Research Institute for Infectious Diseases and the U.S. Army Medical Research Institute for Chemical Defense.			
<b>Accomplishments/Planned Programs Subtotals</b>	9.607	9.339	13.864

**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:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> MS6 / RDT&E MGT SUPPORT
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
MS6: RDT&E MGT SUPPORT	-	37.035	21.212	32.220	-	32.220	32.337	31.195	32.257	32.555	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides management support for the DoD Chemical and Biological Defense Program (CBDP). It includes program oversight and integration of overall non-CBRN Defense Equipment (non-CDE) and CBRN Defense Equipment (CDE) programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)) and defense programs through the Deputy Assistant Secretary of Defense for Chemical and Biological Defense (DASD(CBD)). Funds execution management is provided by DTRA.

The project also provides for the development, coordination and integration of Joint Chemical, Biological, Radiological and Nuclear (CBRN) defense capability requirements, including assistance and support to the Combatant Commanders (COCOMs) and Services to improve CBRN defense related doctrine, education, training, and awareness by the Joint Requirements Office (JRO); preparation of Joint Capability Integration and Development System (JCIDS) documents in accordance with Chairman of The Joint Chiefs of Staff Instruction CJCSI 3170.011 dated 23 January 2015; Joint CBRN Defense Research, Development, and Acquisition (RDA) planning; input to the CBD Annual Report to Congress; and program guidance development by the Program Analysis and Integration Office (PAIO).

The Biological Select Agent and Toxin (BSAT) Biosafety Program Office (BBPO) will advise the Executive Agent Responsible Official (EA RO) for the DoD BSAT Biosafety Program on biosafety and all matters that pertain to risk associated with BSAT operations, provide oversight of DoD BSAT laboratory biosafety operations, serve as a unified DoD interface with external regulatory agencies, ensure safety and standardization of procedures used in DoD BSAT laboratories, and identify industry-wide best practices to enhance biosafety across the full spectrum of DoD BSAT operations. As the EA RO for BSAT the program is tasked with technical review, inspection, and harmonization of biosafety protocols and procedures across DoD laboratories that handle BSAT. As such, the program manages the Biosafety and Scientific Review Panel, inspection of DoD laboratories, harmonization of DoD BSAT-related regulations and procedures, coordinating interaction and information with the CDC, establishing a Defense Business System to track and manage BSAT across DoD, providing laboratory biosafety oversight, and advancing BSAT-related scientific research to address knowledge gaps. This office was established in March 2016 and prior to FY 2018 is funded within the OSD Management line.

The project includes programming support for the Joint Service CB Information System (JSCBIS) which serves as a budgetary and informational database for the DoD CBDP. Also included within the project is financial management services to include fund distribution, execution reporting, and fiscal financial statements.

This project also supports the Chemical, Biological, Radiological and Nuclear Defense (CBRND) Test and Evaluation (T&E) Executive, who is responsible for the planning, balancing, and oversight of test infrastructure and test technology requirements to support Developmental Testing (DT) and Operational Testing (OT) of DoD CBRND systems, as outlined in the RDA Plan. The CBRND T&E Executive oversees the Enterprise processes to develop and sustain standardized T&E methodologies and validated instrumentation and infrastructure to ensure the adequacy of test for CBRND systems in alignment with acquisition milestones and associated decision points. The Joint Test Infrastructure Working Group (JTIWG) program supports T&E Early Involvement; test threat planning; T&E studies; and T&E standards planning and development to support CBRND testing for all Services to include medical T&E efforts.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> MS6 / RDT&E MGT SUPPORT

The CBRND T&E Executive directly supports OSD T&E oversight of acquisition programs and provides the mechanism for early T&E involvement in the acquisition process. The CBRND T&E Executive provides the T&E infrastructure investment strategy and coordinates investment planning and T&E capabilities validation among the Joint Service Community to ensure that program needs are met. The CBRND T&E Executive oversees the T&E processes to ensure end to end feedback loops to support to the Warfighter.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Title:</b> 1) OSD BIOSAFETY</p> <p><b>FY 2018 Plans:</b> Achieve full program staffing. Provide oversight of DoD BSAT inspection activities. Implement Quality Management System. Continue development of BSAT training products. Execute regular council stakeholder meetings. Continue to advance BSAT training and conduct protocol reviews, and publish guidance and procedures from biannual BSRP meetings. Continue coordination with CDC. Maintain and improve the Defense BSAT Business System. Implement third-party testing. Perform laboratory site visits, and fund research to address safety-related scientific knowledge gaps.</p>	-	-	2.719
<p><b>Title:</b> 2) JRO MGT</p> <p><b>FY 2016 Accomplishments:</b> Implemented CBRN Defense medical and non-medical capabilities development by representing the Services and COCOMs in JCIDS and acting as their proponent for coordinating and integrating CBRND operational capabilities. Chaired the CWMD Working Group for the Protection Functional Capabilities Board (FCB). Served as the Joint Staff focal point for CBRN reports, assessments, meetings, agreements, concepts and studies, ATDs, and JCTDs. Led the CBDP Enterprise POM development. Prepared various JCIDS documents, including AoAs, IS ICDs, CDDs, and CPDs.</p> <p><b>FY 2017 Plans:</b> Will implement CBRN Defense medical and non-medical capabilities development by representing the Services and COCOMs in JCIDS and acting as their proponent for coordinating and integrating CBRND operational capabilities. Will chair the CWMD Working Group for the Protection FCB. Will serve as the Joint Staff focal point for CBRN reports, assessments, meetings, agreements, concepts and studies, ATDs, and JCTDs. Will lead the CBDP Enterprise POM development. Will prepare various JCIDS documents, including AoAs, IS ICDs, CDDs, and CPDs.</p> <p><b>FY 2018 Plans:</b> Will implement CBRN Defense medical and non-medical capabilities development by representing the Services and COCOMs in JCIDS and acting as their proponent for coordinating and integrating CBRND operational capabilities. Will chair the CWMD Working Group for the Protection FCB. Will serve as the Joint Staff focal point for CBRN reports, assessments, meetings,</p>	4.211	5.474	6.500

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> MS6 / RDT&E MGT SUPPORT

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
agreements, concepts and studies, ATDs, and JCTDs. Will lead the CBDP Enterprise POM development. Will prepare various JCIDS documents, including AoAs, IS ICDs, CDDs, and CPDs.			
<b>Title:</b> 3) JTIWG	5.742	3.716	7.389
<p><b>FY 2016 Accomplishments:</b> Continued T&amp;E Executive mission support to ensure credible testing; T&amp;E Early Involvement; T&amp;E Studies; evaluation and decision support for CBDP systems; support the DOT&amp;E for OSD T&amp;E Oversight; and support the NCB in infrastructure planning; provided input to the POM process; and established T&amp;E Standards to support the White House Subcommittee on Standards and other interagency groups. Continued efforts to develop, refine, and streamline processes for identifying, assessing, and addressing gaps in T&amp;E capabilities to ensure timely support to acquisition programs. Continued mission to improve the quality and reduce the costs of test planning and execution; eliminated unnecessary redundancies in test infrastructure. Continued direct support of the JRO ICTs and IPTs providing technical assistance to structure acquisition programs, planning for Analysis of Alternatives, and developing test scopes. Continued direct coordination of early involvement of the OTAs and other T&amp;E organizations in T&amp;E infrastructure planning, development, and validation. Continued to develop threat test support documentation to support DT and OT. Continued direct support to the JPEO-CBD. Programs supported included JBTDs; NGCD Increments 1 through 3; UIPE II; JECF; NGDS; JBADS; CIDAS; ECD JCACS; JSEW; Joint General Purpose Decontamination--Heavy Materiel Equipment (JGPD-HME); JEM; JCAD integration in into Stryker Nuclear, Biological, and Chemical Reconnaissance System; JWARN; CALS; all variants of JSAM; and other active acquisition programs including JUPITR ATD. Continued support to JPEO-CBD, JSTO, and WDTC for specific test methodology and test technology needs; technology transition planning for T&amp;E methodologies, resources and infrastructure; and participation in scientific review panels. Continued to provide guidance to improve TEMPs for acquisition programs; approval of TEMPs; development of threat support documentation; and validation of T&amp;E Capabilities and associated standards. Continued supporting OTAs in coordination of Lead OTA assignment, integration of test planning, issue resolution, and facilitation of OSD approval of test documents. Continued to lead the International T&amp;E methodology development and standardization efforts to support the Australia, Canadian, UK, and US MOU and other international partnering agreements. Provided T&amp;E infrastructure input to the POM process and supported the Services, JRO, PAIO, and NCB in development and defense of POM and Budget submissions. Conducted Red Team, Table Top Exercises (TTXs) and TEMP training for IPTs. Participated in DT and OT Test Readiness Reviews (TRR) to determine if the testing planning was adequate for execution.</p> <p><b>FY 2017 Plans:</b> Continue T&amp;E Executive mission support to ensure credible testing; T&amp;E Early Involvement; T&amp;E Studies; evaluation and decision support for CBDP systems; support the DOT&amp;E for OSD T&amp;E Oversight; and support the NCB in infrastructure planning; input to the POM process; and establishing T&amp;E Standards to support the White House Subcommittee on Standards and other interagency groups. Continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing</p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> MS6 / RDT&E MGT SUPPORT

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in test infrastructure. Sponsor technical efforts to mitigate critical Test and Evaluation Gaps in order to reduce cost/test schedule impacts to near-term PORs. Develop new policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies.  <b>FY 2018 Plans:</b> Continue T&E Executive mission support to ensure credible testing; T&E Early Involvement; T&E Studies; evaluation and decision support for CBDP systems; support the DOT&E for OSD T&E Oversight; and support the NCB in infrastructure planning; input to the POM process; and establishing T&E Standards to support the White House Subcommittee on Standards and other interagency groups. Continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in test infrastructure. Continue efforts to identify and mitigate critical Test and Evaluation Gaps in order to reduce cost/test schedule impacts to near-term PORs. Continue to align and streamline policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies.			
<b>Title:</b> 4) OSD MGT  <b>FY 2016 Accomplishments:</b> Performed program reviews/assessments, provided programmatic PPBE oversight/analysis, and provided congressional issue analysis and support. Supported financial management services provided by DTRA, such as funding distribution and execution reporting.  <b>FY 2017 Plans:</b> Perform program reviews/assessments, provide programmatic PPBE oversight/analysis, and provide congressional issue analysis and support. Support financial management services provided by DTRA, such as funding distribution and execution reporting.  <b>FY 2018 Plans:</b> Perform program reviews/assessments, provide programmatic PPBE oversight/analysis, and provide congressional issue analysis and support. Support financial management services provided by DTRA, such as funding distribution and execution reporting.	20.338	6.922	9.117
<b>Title:</b> 5) PAIO MGT  <b>FY 2016 Accomplishments:</b> Developed assessments to support RDA Planning. Provided analytic programmatic support for development of program guidance, the Program, Budget and Execution Reviews, and the President's Budget submissions. Responded to specialized	6.744	5.100	6.495

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> MS6 / RDT&E MGT SUPPORT
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
evaluation studies throughout the PPBE process. Provided Joint Service Chemical Biological Information System database management.  <b>FY 2017 Plans:</b> Develop assessments to support RDA Planning. Provide analytic programmatic support for development of program guidance, the Program, Budget and Execution Reviews, and the President's Budget submissions. Respond to specialized evaluation studies throughout the PPBE process. Provide Joint Service Chemical Biological Information System database management.  <b>FY 2018 Plans:</b> Develop assessments to support RDA Planning. Provide analytic programmatic support for development of program guidance, the Program, Budget and Execution Reviews, and the President's Budget submissions. Respond to specialized evaluation studies throughout the PPBE process. Provide Joint Service Chemical Biological Information System database management.			
<b>Accomplishments/Planned Programs Subtotals</b>	37.035	21.212	32.220

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)				<b>Project (Number/Name)</b> O49 / JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
O49: JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)	-	1.300	1.379	1.500	-	1.500	1.500	1.500	1.500	1.500	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The objectives of the Joint Concepts, Studies, and Analyses (JCSA) program are to support the Joint Requirements Office to develop, coordinate, and execute CBRND studies, experiments, analyses and architecture, in order to develop future operational concepts and support the efficient and effective generation of CBRN requirements.

Specific lines of effort across the Future Years Defense Program (FYDP) include: qualitatively characterizing emerging CBRN threats and operational risks to the Joint Force; conducting innovative approaches to deal with technical studies; analyzing Concepts of Operations for employing and developing capabilities; and analyzing specific issues that contribute to POM development.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) JCDE	1.300	1.379	-
<b>FY 2016 Accomplishments:</b> Continued JCDE analysis. Continued to perform Advanced Threat Analysis with several more categories of threat. Updated best representative agents for consideration in requirements and testing. Conducted detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. Updated detailed operational risk analyses to support CDBP leadership decisions.			
<b>FY 2017 Plans:</b> Continue JCDE analysis. Will continue to perform Advanced Threat Analysis with several more categories of threat. Will update best representative agents for consideration in requirements and testing. Will conduct detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. Will update detailed operational risk analyses to support CDBP leadership decisions.			
<b>Title:</b> 2) JCSA	-	-	1.500
<b>Description:</b> This program was formerly called Joint Combat Development and Experimentation (JCDE). Will continue JCDE analysis. This program performs Advanced Threat Analysis with several more categories of threat than JCDE. JCSA updates the best representative agents for consideration in requirements and testing. This program also conducts detailed quantitative			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605384BP / CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	<b>Project (Number/Name)</b> O49 / JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. JCSA also updates detailed operational risk analyses to support CBDP leadership decisions.			
<b><i>FY 2018 Plans:</i></b> Funds in JCDE were transferred to this program, Joint Concepts Studies and Analyses (JCSA), to perform strategic level studies in lieu of direct tactical level experimentation, to better define overarching properties. Will continue to perform Advanced Threat Analysis with several more categories of threat. Will update best representative agents for consideration in requirements and testing. Will conduct detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. Will update detailed operational risk analyses to support CBDP leadership decisions.			
<b>Accomplishments/Planned Programs Subtotals</b>	1.300	1.379	1.500

**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-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 6: RDT&amp;E Management Support</i>	<b>R-1 Program Element (Number/Name)</b> PE 0605502BP / <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	19.065	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	19.065
SB6: <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>	-	19.065	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	19.065

**A. Mission Description and Budget Item Justification**

The overall objective of the CBD SBIR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment.

**B. Program Change Summary (\$ in Millions)**

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	19.065	0.000	0.000	-	0.000
Total Adjustments	19.065	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	19.065	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-		-	-

**Change Summary Explanation**

Funding: FY16 - Funding transferred and applied to SBIR program (+\$19,065K).

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 6					<b>R-1 Program Element (Number/Name)</b> PE 0605502BP / <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>				<b>Project (Number/Name)</b> SB6 / <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
SB6: <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>	-	19.065	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0	19.065
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The SBIR Program is a Congressionally mandated program established to increase the participation of small business in federal research and development (R&D). Currently, each participating Government agency must reserve 2.5% of its extramural R&D for SBIR awards to competing small businesses. The goal of the SBIR Program is to invest in the innovative capabilities of the small business community to help meet Government R&D objectives while allowing small companies to develop technologies and products which they can then commercialize through sales back to the Government or in the private sector.

The Small Business Technology Transfer (STTR) Program like SBIR, is a Government-wide program, mandated by the Small Business Research and Development Enhancement Act of 1992, PL 102-564. STTR was established in FY94 as a three-year pilot program. In early 1996, the General Accounting Office (GAO) conducted a comprehensive review of the Government-wide STTR Program to determine the effectiveness of the pilot program. Upon review of the GAO report, Congress voted to reauthorize the STTR Program to the year 2000, consistent with the authorization period for the SBIR Program.

STTR was established as a companion program to the SBIR Program and is executed in essentially the same manner; however, there are several distinct differences. The STTR Program provides a mechanism for participation by university, Federally-Funded Research and Development Centers (FFRDCs), and other non-profit research institutions. Specifically, the STTR Program is designed to provide an incentive for small companies and research at academic institutions and non-profit research and development institutions to work together to move emerging technical ideas from the laboratory to the marketplace to foster high-tech economic development and to advance U.S. economic competitiveness. Each STTR proposal must be submitted by a team which includes a small business (as the prime contractor for contracting purposes) and at least one research institution, which have entered into a Cooperative Research and Development Agreement for the purposes of the STTR effort. Furthermore, the project must be divided up such that the small business performs at least 40% of the work and the research institution(s) performs at least 30% of the work. The remainder of the work may be performed by either party or a third party. The budget is separate from the SBIR budget and is significantly smaller (0.15% of the extramural R&D budget vs. 2.5% for the SBIR Program).

The DoD has consolidated management and oversight of the CBDP into a single office within the OSD. The Army was designated as the Executive Agent for coordination and integration of the Chemical and Biological Defense (CBD) program. The executive agent for the SBIR/STTR portion of the program is the Army Research Office-Washington.

The overall objective of the CBD SBIR/STTR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 6	<b>R-1 Program Element (Number/Name)</b> PE 0605502BP / <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>	<b>Project (Number/Name)</b> SB6 / <i>SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)</i>
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passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) SBIR/STTR	19.065	-	-
<b>Description:</b> Small Business Innovative Research.			
<b>FY 2016 Accomplishments:</b> SBIR/STTR			
<b>Accomplishments/Planned Programs Subtotals</b>	19.065	-	-

**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-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	28.278	33.361	45.677	-	45.677	51.510	41.653	39.790	50.272	Continuing	Continuing
CA7: <i>CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV</i>	-	4.644	6.113	6.393	-	6.393	6.799	6.897	9.450	11.815	Continuing	Continuing
CM7: <i>HOMELAND DEFENSE (OP SYS DEV)</i>	-	1.878	1.627	1.652	-	1.652	4.454	4.454	4.437	4.437	Continuing	Continuing
CO7: <i>COLLECTIVE PROTECTION (OP SYS DEV)</i>	-	0.000	4.466	5.127	-	5.127	3.586	0.988	0.895	0.703	Continuing	Continuing
IP7: <i>INDIVIDUAL PROTECTION (OP SYS DEV)</i>	-	2.978	1.059	1.747	-	1.747	2.056	2.092	2.021	2.663	Continuing	Continuing
IS7: <i>INFORMATION SYSTEMS (OP SYS DEV)</i>	-	7.556	10.357	12.203	-	12.203	15.461	16.888	16.172	14.298	Continuing	Continuing
MB7: <i>MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)</i>	-	8.541	7.145	11.950	-	11.950	12.836	4.918	1.082	10.623	Continuing	Continuing
TE7: <i>TEST &amp; EVALUATION (OP SYS DEV)</i>	-	2.681	2.594	6.605	-	6.605	6.318	5.416	5.733	5.733	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This program element supports developmental efforts to upgrade systems in the Department of Defense (DoD) Chemical Biological Defense Program that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

Efforts in this program element support the upgrade of fielded CB defense equipment against emerging chemical threat agents and toxic industrial chemicals. Specifically this program includes: (1) the upgrade and modernization of contamination avoidance systems; (2) the upgrade and modernization of homeland defense systems; (3) the upgrade and modernization of information systems; (4) the Software Support Activity (SSA); (5) the upgrade and modernization of medical systems; (6) upgrade and modernization of BSL3 systems; and (7) revitalization and technical upgrade of existing instrumentation and equipment at Dugway Proving Ground (DPG) supporting WDTC and BTB-ECBC.

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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	33.561	33.361	43.983	-	43.983
Current President's Budget	28.278	33.361	45.677	-	45.677
Total Adjustments	-5.283	0.000	1.694	-	1.694
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-5.283	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	1.694	-	1.694

**Change Summary Explanation**

Funding: FY18 - Initiate development (\$7M) of additional FDA cleared medical diagnostic assay for the Alphavirus's (Eastern Equine Encephalitis/Venezuela Equine Encephalitis/Western Equine Encephalitis) and Orthopox (Variola major-Smallpox, Variola minor, Pan-Orthopox, Monkeypox). Adjustments due to fact-of-life changes (\$5).

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> CA7 / CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CA7: CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV	-	4.644	6.113	6.393	-	6.393	6.799	6.897	9.450	11.815	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides the technology upgrade and refresh effort for the Chemical Biological Radiological Nuclear Dismounted Reconnaissance Systems (CBRN DRS) with emerging technologies and capabilities which will address and mitigate equipment obsolescence.

The CBRN Dismounted Reconnaissance Systems (CBRN DRS) consists of portable, commercial and Government off-the-shelf equipment which provides personnel protection from current and emerging CBRN hazards through detection, identification, sample collection, decontamination, marking, and hazard reporting for CBRN threats. The CBRN DRS supports Dismounted Reconnaissance, Surveillance, and CBRN Sensitive Site Assessment missions which enables more detailed and near real-time CBRN information flow for the Warfighter. The program will address emerging CBRN threat requirements in order to provide an enhanced capability for the future. The CBRN DRS Inc 2 supports Dismounted Reconnaissance, Surveillance, and CBRN Sensitive Site Exploration missions which enables more detailed and near real-time CBRN information flow for the Warfighter.

Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) CBRN DRS	4.644	6.113	6.393
<b>FY 2016 Accomplishments:</b> Completed market analysis on Solid and Liquid Identification Kit (SLIK). Purchased components for testing for SLIK evaluation. Initiated testing for SLIK. Continued market analysis for additional components.			
<b>FY 2017 Plans:</b> Continue market analyses on emerging technologies for potential upgrades to the system. Continue obsolescence management activities for existing fielding components. Continue purchasing components for testing. Continue testing of potential candidates. Initiate changes to product baseline.			
<b>FY 2018 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> CA7 / CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
Continue market analyses on emerging technologies for potential upgrades to the system. Continue obsolescence management activities for existing fielding components. Continue purchasing components for testing. Continue testing of potential candidates. Initiate changes to product baseline.			
<b>Accomplishments/Planned Programs Subtotals</b>	4.644	6.113	6.393

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

N/A

**Remarks**

**D. Acquisition Strategy**

CBRN DISMOUNTED RECONNAISSANCE SYSTEMS

BA4: The Chemical Biological Radiological Dismounted Reconnaissance Systems (CBRN DRS) Inc 2 program will provide an Advanced Capabilities Set (ACS) for use by Joint Technical Forces in Sensitive Site Assessment in conjunction with their existing baseline CBRN DRS Inc 1 system. The ACS will be comprised of Government (GOTS) and commercial off-the-shelf (COTS) equipment to the greatest extent possible. The ACS will be used by Joint Technical Forces in conjunction to their CBRN DRS Inc 1 system to support Sensitive Site Exploitation. Requirements analysis will support Materiel Development Decision and study guidance for the Analysis of Alternatives (AoA). The AoA will identify potential solutions and support further requirements development, culminating in an approved Capabilities Development Document. Contracting efforts will be initiated under the Joint Enterprise Research, Development, Acquisition and Production Contracts. Contracting will cover a base period of performance for development/integration with options for Low-Rate and Full Rate Production (FRP).

BA7: The Chemical Biological Radiological Dismounted Reconnaissance Systems (CBRN DRS) program uses a government-off-the-shelf (GOTS)/commercial-off-the-shelf (COTS) non-developmental item (NDI) single step acquisition approach to a full capability. This strategy employs an NDI acquisition concept to establish a simplified management framework to translate mission needs and emerging technology capabilities into a stable, affordable, well-managed acquisition program. CBRN DRS systems will be produced using a workshare approach between Organic assets and Contractor production facilities.

**E. Performance Metrics**

N/A



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> CM7 / HOMELAND DEFENSE (OP SYS DEV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CM7: HOMELAND DEFENSE (OP SYS DEV)	-	1.878	1.627	1.652	-	1.652	4.454	4.454	4.437	4.437	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, Concept of Operations (CONOPS) and Tactics, Techniques and Procedures (TTP)s.

The Weapons of Mass Destruction Civil Support Team (WMD CST) Program supports the fielded system upgrade and ongoing assessment and acquisition of commercial off-the-shelf (COTS) and Government off-the-shelf (GOTS) analytical detection, protection, decontamination and sampling equipment for survey in order to expand/enhance the operational capabilities of the (57) WMD CST Teams.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Title:</b> 1) WMD CST - Component Test and Evaluation</p> <p><b>FY 2016 Accomplishments:</b> Provided system-related test activities for NGB's Electro Static Discharge (ESD) System and the Area RAE Chemical Detection System, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system. This element also includes costs of the detailed planning, conduct, support, data reduction, and reports from such testing, as well as hardware items that are consumed or planned to be consumed in the conduct of such operations.</p> <p><b>FY 2017 Plans:</b> Provides system-related test activities, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system. This element also includes costs of the detailed planning, conduct, support, data reduction, and reports from such testing, as well as hardware items that are consumed or planned to be consumed in the conduct of such operations.</p> <p><b>FY 2018 Plans:</b> Provides system-related test activities, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system. This element also includes costs of the detailed planning, conduct, support, data reduction, and reports from such testing, as well as hardware items that are consumed or planned to be consumed in the conduct of such operations.</p>	1.078	1.115	0.937
<p><b>Title:</b> 2) WMD CST - System Engineering and Program Management</p> <p><b>FY 2016 Accomplishments:</b></p>	0.800	0.512	0.715

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> CM7 / HOMELAND DEFENSE (OP SYS DEV)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
<p>Provided system engineering and technical control, as well as the business management of the system/program. It encompasses the overall planning, direction, and control of the definition, development, and production of the system, including functions of logistics engineering and integrated logistics support (ILS) management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system).</p> <p><b>FY 2017 Plans:</b> Provides system engineering and technical control, as well as the business management of the system/program. It encompasses the overall planning, direction, and control of the definition, development, and production of the system, including functions of logistics engineering and integrated logistics support (ILS) management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system).</p> <p><b>FY 2018 Plans:</b> Provides system engineering and technical control, as well as the business management of the system/program. It encompasses the overall planning, direction, and control of the definition, development, and production of the system, including functions of logistics engineering and integrated logistics support (ILS) management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system).</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	1.878	1.627	1.652

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

**Remarks**

**D. Acquisition Strategy**  
WMD - CIVIL SUPPORT TEAMS (WMD CST)

The Weapons of Mass Destruction Civil Support Team Program (WMD-CST) is a COTS based program that supports the evaluation of advancements in CBRN commercial off the shelf (COTS)/government-off-the-shelf (GOTS) equipment against the current technology baseline of equipment fielded to the (57) WMD CST Teams. As such, the program establishes a time phased modernization plan to integrate and incorporate proven advancements in commercially available technology into the CST operating mission set based on highest priority capability requirements and availability of resources.

**E. Performance Metrics**  
N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> CO7 / COLLECTIVE PROTECTION (OP SYS DEV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CO7: COLLECTIVE PROTECTION (OP SYS DEV)	-	0.000	4.466	5.127	-	5.127	3.586	0.988	0.895	0.703	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides for the upgrade and modernization of Collective Protection (CP) equipment and systems including Modernization Protection (MODPROT) for fielded CP systems and Joint Expeditionary Collective Protection (JECP).

MODPROT provides upgrades, improvements and modernizations to fielded Collective Protection Systems such as the Chemical and Biological Protective Shelter, Shipboard Collective Protection Systems, Fixed Site Collective Protection Systems, M20A1 Simplified Collective Protection Equipment, Modular Collective Protection Equipment systems, and Collectively Protected Field Hospitals. Funding increases the Collective Protection System Backfit program M98 filter set life extension, and identifies and tests replacements for obsolete M93 Gas Particulate Filter Unit (GPFU) components used in numerous hard shelter systems. The M93 GPFU improvements also address current electromagnetic interference requirements.

JECP provides the Joint Expeditionary Forces a CP capability which is lightweight, compact, modular, and affordable. A family of systems, developed in two phases, that will allow the application of CP to transportable soft-side shelters, enclosed spaces of opportunity, and in remote austere locations as a standalone resource. Phase 1 includes standalone CP systems and kits to provide existing host platforms and structures with CBRN protection. Phase 2 includes kits to provide other host platforms and structures that were not explicitly designed in Phase 1. JECP will be capable of protecting personnel groups of varying size, unencumbered by Individual Protective Equipment (IPE), from the effects of CB agents, Toxic Industrial Materials (TIMs), radiological particles, heat, dust, and sand. The employment of JECP is a strategic deterrence against enemy use of CBR agents or TIMs, and will reduce the need for personnel and equipment decontamination. Funding will develop a field leakage test capability that allows Warfighters to validate the integrity of JECP and other fielded collective protection systems, integrate newly developed filtration material into existing M98 Gas Particulate Filter Sets to provide the Warfighter with improved protection against toxic industrial chemicals and toxic industrial materials while maintaining current performance characteristics against Chemical Warfare Agents and meeting military standards, develop a CP kit for non-CP environmental control units and improve on the current tent liner restraint systems.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) MODPROT Collective Protection Modernization	-	-	0.800
<b>Description:</b> Modular Collective Protection Equipment (MCPE) M93 Gas Particulate Filter Unit (GPFU) 100-cfm main fan and system control module improvements and Collectively Protected Field Hospital obsolescence issues specific to Chemically Protected Deployable Medical System (CPDEPMEDS) System components.			
<b>FY 2018 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> CO7 / COLLECTIVE PROTECTION (OP SYS DEV)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Obtain test articles of vendor provided M93 GPFU replacement components for evaluation against Government electromagnet interference (EMI) standards. Review existing test reports. Obtain test articles and perform surveillance testing to determine Collective Protection System Backfit (CPSBKFT) M98 filter set service life extension times. Evaluate collective protection equipment types and quantities required to upgrade legacy components based on the new CPDEPMEDS configuration.				
<p><b>Title:</b> 2) JECP Field Leakage Test Capability</p> <p><b>Description:</b> Improve field leakage test capability, simulate test methods and field operator procedures.</p> <p><b>FY 2017 Plans:</b> Initiate development of a field leakage test capability. Evaluate existing laboratory test methods for application in the field. Down select designs, tracer materials and develop field operator procedures.</p> <p><b>FY 2018 Plans:</b> Develop technical data package to include: level three drawings and technical manuals. Update design and conduct user evaluation for candidate solutions.</p>		-	0.296	0.485
<p><b>Title:</b> 3) JECP Filtration Improvements</p> <p><b>Description:</b> Improve M98 filter set capability.</p> <p><b>FY 2017 Plans:</b> Initiate design and development of improved M98 filter set capability to meet additional chemical / biological (CB) and toxic industrial chemical (TIC) / toxic industrial material (TIM) protection requirements. Initiate preliminary testing and procure CB/TIC/ TIM materials for testing.</p> <p><b>FY 2018 Plans:</b> Continue design and form-fit-function development. Fabricate prototypes and perform required testing. Perform detailed cost/benefit analysis. Develop and update drawing packages. Develop and update logistics package.</p>		-	4.170	3.640
<p><b>Title:</b> 4) JECP Chemical/Biological Hardened Environmental Control Unit Improvements</p> <p><b>Description:</b> Environment control unit (ECU) collective protection (CoIPro) kit development for non-CoIPro ECUs</p> <p><b>FY 2018 Plans:</b> Finalize prototype development and conduct prototype testing.</p>		-	-	0.080
<p><b>Title:</b> 5) JECP Liner and Liner Restraint System Improvements</p> <p><b>Description:</b> Tent kit liner and liner restraint system improvements.</p>		-	-	0.122

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> COT / COLLECTIVE PROTECTION (OP SYS DEV)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>FY 2018 Plans:</b> Continue updates to the drawing package and technical manuals. Implement engineering changes.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	4.466	5.127

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

N/A

**Remarks**

**D. Acquisition Strategy**

MODERNIZATION PROTECTION (MODPROT)

Modernizing Collective Protection leverages mature technology from contractor developed components to address and replace obsolete components of various fielded collective protection systems. Modernization efforts will also use items developed by the government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing will validate both government and contractor furnished improvements. The improvements will be added into the specific system's updated technical data packages to be used in engineering change proposals and provided to the item managers.

JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)

Strategy based on evolutionary development, based on a family of systems approach. After MS B, awarded competitive Cost Plus Incentive Fee (CPIF) contract to Science Applications International Corporation (now Leidos) in 2008 to build prototypes subjected to robust engineering developmental testing and Operational Assessment during the Engineering and Manufacturing Development (EMD) phase. After MS C, awarded a Firm Fixed Price (FFP) option to Leidos in September 2013 for Low Rate Initial Production (LRIP) systems to support formal Developmental Testing (DT) and Multi-Service Operational Test & Evaluation (MOT&E) events. In addition, a Fixed Price Incentive Firm Target (FPIF) option was awarded to Leidos in January 2014 to perform non-recurring engineering (NRE) and logistic product development associated with the LRIP system configurations. A post MS C Milestone Decision Authority Acquisition Decision Memorandum, dated March 2014, separated the program into two phases. Phase 2 systems will be developed as engineering changes to Phase 1 systems. The Full Rate Production (FRP) decision for Phase 1 systems, dated December 2016, addressed business case analysis results and approved a full and open competition build-to-print production task order under the Joint Enterprise Research, Development, Acquisition, and Production/Procurement Contract. Phase 2 systems will undergo limited developmental and operational testing and then pursue a MS C full rate production decision. BA7 funding develops incremental improvements to fielded JECP variants.

**E. Performance Metrics**

N/A

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IP7 / INDIVIDUAL PROTECTION (OP SYS DEV)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
IP7: INDIVIDUAL PROTECTION (OP SYS DEV)	-	2.978	1.059	1.747	-	1.747	2.056	2.092	2.021	2.663	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

MODPROT addresses obsolescence issues with Individual Protective equipment and the need to modernize the Joint Services fielded chemical and biological protection with capabilities meeting or exceeding the Services requirements. MODPROT will modernize and transition the current chemical protective overboot to the Moulded AirBoss Lightweight Overboot (MULO), conduct a modernization effort of the Integrated Footwear System (IFS), conduct a modernization effort of the JSLIST Block 1 Glove Upgrade Flame Resistant (JB1GU FR) glove, and conduct reverse engineering of maintenance and repair procedures for the Joint Services Mask Leakage Tester (JSMLT).

JSGPM provides for filter modernization and enhancements against Toxic Industrial Chemicals (TICs) and Toxic Industrial Materials (TIMs) on the Joint Service General Purpose Mask (JSGPM) and conducting a Limited Users Evaluation (LUE) in support of the Alternative Source Qualification plan for a suitable replacement to the Alternative Footwear Solution. Filter upgrades will be provided for fielded Protection systems to enhance respiratory and ocular protection.

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

	FY 2016	FY 2017	FY 2018
<p><b>Title:</b> 1) MODPROT Individual Protection Modernization</p> <p><b>Description:</b> Alternative Footwear Solution (AFS) Limited User Evaluation (LUE)</p> <p><b>FY 2018 Plans:</b> Initiate and conduct a coordinated LUE with Defense Logistics Agency through the Army Test and Evaluation Command as part of the Alternative Source Qualification to determine vendors' ability to meet AFS requirements.</p>	-	-	0.051
<p><b>Title:</b> 2) JSGPM</p> <p><b>Description:</b> Advanced Respiratory Protection Initiative (ARPI) - M61 Filter Modernization</p> <p><b>FY 2016 Accomplishments:</b> Built M61 and C2A1 filters using layered bed technology using Cobalt-Zinc, zirconium hydroxide, Argentum(Silver), TEDA (triethylene diamine)(CoZZAT) and improved carbon technology. Advanced the maturity of the CoZZAT and layered bed manufacturing processes. Conducted testing of the prototypes to include testing in relevant environments. Continued investigation of the impact of breathing cycles on the performance of the new media.</p> <p><b>FY 2017 Plans:</b></p>	2.978	1.059	1.696

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IP7 / INDIVIDUAL PROTECTION (OP SYS DEV)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
Continue maturation of CoZZAT filters. Begin MOF filter bed design analysis and initial prototype builds as technology transitions from JSTO. Receive initial feasibility prototypes on the C2A1-size prototypes and initiate testing to determine manufacturability and integration.  <b>FY 2018 Plans:</b> Conduct Product Qualification Testing (PQT) of the Cobalt-Zinc, zirconium hydroxide, Argentum(Silver), TEDA (triethylene diamine)(CoZZAT) technology and begin the Metal Organic Framework (MOF) integration into the M61 filter.			
<b>Accomplishments/Planned Programs Subtotals</b>	2.978	1.059	1.747

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• JI0003: JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)	60.184	55.118	48.493	-	48.493	16.927	18.166	0.000	0.000	0	198.888

**Remarks**

**D. Acquisition Strategy**

MODERNIZATION PROTECTION (MODPROT)

Modernize Individual Protection, as part of the Alternative Source Qualification test and evaluation approach, conducts an evaluation of the Moulded Airboss Lightweight Overboot (MALO) as a potential substitute to the Alternative Footwear Solutions (AFS) CBRN Protective Overboot. Part of this evaluation includes a performance assessment of the MALO physical properties relative to the AFS and AFS performance requirements.

JS GENERAL PURPOSE MASK (JSGPM)

The JSGPM Advanced Respiratory Protection Initiative (ARPI) effort is using the two M61 filter contracts awarded to 3M and Avon to develop improved filters for the JSGPM. There is a continual technology refreshment CLIN on both contracts that allow for filter development tasks to be awarded. The tasks can be competed between the two awardees or awarded to both to ensure competition on future spares and delivery orders. As filter technologies transition from the Defense Threat Reduction Agency (DTRA) and Joint Science and Technology Office (JSTO), the technologies will be matured from system/subsystem prototyping demonstration technologies at Technology Readiness Level (TRL) 6 to actual system "mission proven" through successful mission operations in a mission environment at TRL 9. In addition to the maturing of the technology, the Manufacturing Readiness Level (MRL) of the media and the layered bed design requires maturing to an MRL level 9. The

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 7	PE 0607384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)</i>	IP7 / <i>INDIVIDUAL PROTECTION (OP SYS DEV)</i>

complexity of maturing all these different items requires an evolutionary approach with one prototype iteration governing the approach on the next iteration. With the criticality of the filter, the production transition to the new improved filter has to be done with a high degree of confidence with risks mitigated to a low level.

**E. Performance Metrics**

N/A



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<b>Exhibit R-2A, RDT&amp;E Project Justification: FY 2018 Chemical and Biological Defense Program</b>										<b>Date: May 2017</b>		
<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IS7: INFORMATION SYSTEMS (OP SYS DEV)	-	7.556	10.357	12.203	-	12.203	15.461	16.888	16.172	14.298	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project provides for the upgrade and modernization of fielded Information Systems including the Biosurveillance Portal (BSP), the Joint Effects Model (JEM) and the Joint Warning and Reporting Network (JWARN). This project also provides for the Software Support Activity (SSA) and Chemical Biological Radiological and Nuclear Information Systems (CBRN IS). Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs.

Efforts included in this project are: (1) the Biosurveillance Portal (BSP); (2) the Chemical Biological Radiological and Nuclear Information Systems (CBRN IS); (3) the Joint Effects Model (JEM); (4) the Joint Warning and Reporting Network (JWARN); and (5) the Software Support Activity (SSA).

CBRN IS aligns Joint Program Executive Office for Chemical Biological Defense (JPEO CBD) information technology in order to utilize a common software architecture, eliminate duplicative integration effort, produce interoperable system components, and minimize time-to-market of end user capability. JPEO CBD information technology is assembled from the inventory of available capability in place of the current paradigm where functionality only exists within the individual Joint Effects Model (JEM), Joint Warning and Report Network (JWARN), and Biosurveillance Portal (BSP) applications. CBRN IS aligns with the Joint Information Environment (JIE), such as milCloud, in order to field the integrated capabilities. The JIE is the cornerstone of the DoD's future - providing a secure information framework from our national senior leaders and joint force commanders, command and control forces that deliver responsive, decisive actions from any device; anytime and anywhere.

JEM and JWARN utilize the Joint Capabilities Integration and Development System (JCIDS) Manual prescribed Information Technology Box (IT Box) construct for managing requirements for the follow-on increments of capability development. The "IT Box" is an acquisition approach and methodology regarding how software systems should be developed and fielded. It is a process that differs from the way DoD acquires hardware systems. The acquisition approach uses the Information Systems Initial Capabilities Document (IS ICD) to describe the required operational capabilities for the entire development effort. These overarching requirements are further broken out into Requirements Definition Packages (RDPs) released over the life of the product instead of a single Capability Development Document released early in the program. "Agile Software Development" is a set of industry standard software development methods used in conjunction with the IT Box framework. Agile Software Development promotes adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change. The Agile methodology is an alternative to traditional program management, typically used in software development. It helps teams respond to unpredictability through incremental, iterative work cadences, known as sprints. Agile methodologies are an alternative to waterfall, or traditional sequential development.

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

The Biosurveillance Portal (BSP) was a FY 2016 new start program to address USSOCOM requirements contained in an approved Information Systems Capability Development Document (IS CDD). BSP is a web-based enterprise environment that will facilitate collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological events. BSP bridges the communication gaps in the biosurveillance domain to provide a central access point for biosurveillance information and situational awareness for DoD, interagency and allied partners supporting the early identification and response to biological events. BSP provides an integrated suite of web-based components designed to support public health officers, environmental officers, clinicians, physicians, and CBRN personnel as they maintain their situational awareness of local, regional, and global biological threats to the force. BSP does not duplicate existing DoD capabilities, but rather leverages existing tools and technologies to provide users across multiple organizations and disciplines with a centralized "one-stop shop" for all of their biosurveillance resources.

The BSP Program will utilize BA5 funding to execute the development, testing and evaluation of capabilities to meet the defined program requirements. There will be two Production CDs and two Engineering Drops in FY17. CDs will be evaluated following Developmental Testing (DT) through End-to-End Testing using Users to validate delivered capability as part of the IT Box process thus reducing risk to the program and ensure a quality product is delivered to the Warfighter.

As software-intensive systems, JEM, JWARN, and BSP have no separately identifiable unit production components. BSP, JEM, and JWARN are designated as ACAT III programs and unit cost calculations including Program Acquisition Unit Cost/Average Procurement Unit Cost (PAUC/APUC) and Operations and Sustainment (O&S) average annual per unit costs are not applicable.

The Software Support Activity (SSA) is a Chem-Bio Defense user developmental support and service organization to facilitate net-centric interoperability of systems in acquisition for the Warfighter. The SSA provides the CBRN Warfighter with Joint Service solutions for Cybersecurity/Information Assurance (IA), Integrated Architectures, Data Management/Modeling, Interoperability Certifications, Verification, Validation and Accreditation (VV&A) to support interoperable and integrated net-centric, service-oriented solutions for CBRN systems. The SSA emphasizes development of reference implementations to guide Government and industry system and software developers to ensure that their products meet common interoperability standards. The latest technologies/products include the definition of a Common CBRN Sensor Integration Standard (CCSI) and the CBRN Data Model. These technologies and direct enablers for the development of CBRN integrated sensor networks and the dissemination of CBRN information across all users. The SSA directly supports Chemical and Biological Defense Program (CBDP) initiatives by providing common service oriented architectures and frameworks for the collection and dissemination of Bio-Surveillance and other critical CBRN information.

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

	FY 2016	FY 2017	FY 2018
<b>Title:</b> 1) BSP Modernization Efforts	-	-	0.960
<b>FY 2018 Plans:</b>			
Initial authorization of BA7 funds will be utilized to modernize/upgrade program cloud host provider hardware and maintain			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
compatibility of previously delivered/fielded capabilities to ensure continuity of effort to the User.				
<b>Title:</b> 2) CBRN IS <b>FY 2018 Plans:</b> Continue installations of CBRN IS on milCloud and other data centers.		-	-	0.289
<b>Title:</b> 3) JEM Command and Control (C2) Modernization Efforts <b>FY 2016 Accomplishments:</b> Updated fielded JEM Increment 1 software due to changing Army, Navy, Air Force, Marine Corps, SOCOM, and National Guard C2 host architectures, systems, and standards in order to maintain interoperability and avert cyber threats and vulnerabilities to host C2 systems. Perform test and evaluation of updated JEM Increment 1 baselines. <b>FY 2017 Plans:</b> Continue to update fielded JEM Increment 1 software due to changing Army, Navy, Air Force, Marine Corps, SOCOM, and National Guard C2 host architectures, systems, and standards in order to maintain interoperability and avert cyber threats and vulnerabilities to host C2 systems. Perform test and evaluation of updated JEM Increment 1 baselines. <b>FY 2018 Plans:</b> Continue to update fielded JEM Increment 1 software due to changing Army, Navy, Air Force, Marine Corps, SOCOM, and National Guard C2 host architectures, systems, and standards in order to maintain interoperability and avert cyber threats and vulnerabilities to host C2 systems. Perform test and evaluation of updated JEM Increment 1 baselines. Increased funding planned for the emerging cyber security threats. Strong possibility that there will be significant increases in information assurance and cyber security arena.		0.986	1.626	1.656
<b>Title:</b> 4) JEM Pre-Planned Product Improvement (P3I) <b>FY 2016 Accomplishments:</b> Tested and integrated fielded JEM Increment 1 and Increment 2 software with science and technology upgrades and model enhancements to improve JEM accuracy and precision. Improve architecture and overall performance of all JEM increments through software updates and deficiency resolution. Both increments of JEM software will be supported until all service C2 systems with Increment 1 software are fielded with Increment 2 software. <b>FY 2017 Plans:</b> Test and integrate fielded JEM Increment 1 and Increment 2 software with science and technology upgrades and model enhancements to improve JEM accuracy and precision. Improve architecture and overall performance of all JEM increments		1.859	3.155	3.318

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>through software updates and deficiency resolution. Both increments of JEM software will be supported until all service C2 systems with Increment 1 software are fielded with Increment 2 software.</p> <p><b>FY 2018 Plans:</b> Continue to test and integrate fielded JEM Increment 1 and Increment 2 software with science and technology upgrades and model enhancements to improve JEM accuracy and precision. Improve architecture and overall performance of all JEM increments through software updates and deficiency resolution. Both increments of JEM software will be supported until all service C2 systems with Increment 1 software are fielded with Increment 2 software.</p>				
<p><b>Title:</b> 5) JWARN System Modernization/Update Development</p> <p><b>FY 2016 Accomplishments:</b> Continued engineering and development efforts to upgrade existing, operational JWARN Systems in order to maintain interoperability, efficiency and functionality within the targeted C2 systems while utilizing the IT BOX construct and Agile Software development processes.</p> <p><b>FY 2017 Plans:</b> Continue engineering and development efforts to upgrade existing, operational JWARN Systems in order to maintain interoperability, efficiency and functionality within the targeted C2 systems while utilizing the IT BOX construct and Agile Software development processes.</p> <p><b>FY 2018 Plans:</b> Continue engineering and development efforts to upgrade existing, operational JWARN Systems in order to maintain interoperability, efficiency and functionality within the targeted C2 systems while utilizing the IT BOX construct and Agile Software development processes.</p>		2.698	3.361	3.858
<p><b>Title:</b> 6) JWARN Program Management Support</p> <p><b>FY 2016 Accomplishments:</b> Continued JWARN program financial management, scheduling, planning and reporting support to modernization effort under the IT BOX construct and Agile Software development processes.</p> <p><b>FY 2017 Plans:</b> Continue JWARN program financial management, scheduling, planning and reporting support to modernization effort under the IT BOX construct and Agile Software development processes.</p> <p><b>FY 2018 Plans:</b></p>		0.499	0.606	0.533

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue JWARN program financial management, scheduling, planning and reporting support to modernization effort under the IT BOX construct and Agile Software development processes.				
<b>Title:</b> 7) JWARN IT BOX Test & Evaluation (T&E)		0.331	0.403	0.431
<b>FY 2016 Accomplishments:</b> Completed required Governmental developmental and operational testing on JWARN software updates and modernization efforts under the IT BOX construct and Agile Software testing processes.				
<b>FY 2017 Plans:</b> Continue required Governmental developmental and operational testing on JWARN software updates and modernization efforts under the IT BOX construct and Agile Software testing processes.				
<b>FY 2018 Plans:</b> Continue required Governmental developmental and operational testing on JWARN software updates and modernization efforts under the IT BOX construct and Agile Software testing processes.				
<b>Title:</b> 8) SSA Policies, Standards and Guidelines		0.257	0.254	0.244
<b>FY 2016 Accomplishments:</b> Continued to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration. Updated existing programs and register new programs in the Army Portfolio Management Solution/Army Information Technology Registry (APMS/AITR).				
<b>FY 2017 Plans:</b> Continue to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration. Update existing programs and register new programs in the Army Portfolio Management Solution/Army Information Technology Registry (APMS/AITR).				
<b>FY 2018 Plans:</b> Continue to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration. Update existing programs and register new programs in the Army Portfolio Management Solution/Army Information Technology Registry (APMS/AITR).				
<b>Title:</b> 9) SSA Integrated Architecture		0.251	0.265	0.254
<b>FY 2016 Accomplishments:</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continued to provide and update program of record integrated architectures and provide Net-Centric Policy implementation assistance. Continued to support CCSI updates. Continued to provide CCSI reference implementation. Supported the enterprise tools and common capabilities to ensure relevance across CBRN programs.  <b>FY 2017 Plans:</b> Continue to provide and update program of record integrated architectures and provide Net-Centric Policy implementation assistance. Continue to support CCSI updates. Continue to provide CCSI reference implementation. Support the enterprise tools and common capabilities to ensure relevance across CBRN programs.  <b>FY 2018 Plans:</b> Continue to provide and update program of record integrated architectures and provide Net-Centric Policy implementation assistance. Continue to support CCSI updates. Continue to provide CCSI reference implementation. Support the enterprise tools and common capabilities to ensure relevance across CBRN programs.				
<b>Title:</b> 10) SSA Chemical, Biological, Radiological, Nuclear (CBRN) Data Model  <b>FY 2016 Accomplishments:</b> Achieved a mandated net-centric environment by providing enabling tools which include the CBRN Data Model and Data Dictionary, which define Common CBRN semantics and syntax and the CBRN Extensible Markup Language (XML) schemas that define reusable XML types for information exchange throughout the enterprise.  <b>FY 2017 Plans:</b> Continue updating a mandated net-centric environment by providing enabling tools which include the CBRN Data Model and Data Dictionary, which define Common CBRN semantics and syntax and the CBRN Extensible Markup Language (XML) schemas that define reusable XML types for information exchange throughout the enterprise.  <b>FY 2018 Plans:</b> Continue updating a mandated net-centric environment by providing enabling tools which include the CBRN Data Model and Data Dictionary, which define Common CBRN semantics and syntax and the CBRN Extensible Markup Language (XML) schemas that define reusable XML types for information exchange throughout the enterprise.		0.251	0.247	0.237
<b>Title:</b> 11) SSA Cybersecurity/Information Assurance (CS/IA)  <b>FY 2016 Accomplishments:</b> Continued to maintain proper Information Assurance accreditation of any system within the CBDP portfolio throughout its life-cycle. This includes periodic re-accreditation of JPEO CBDP systems.  <b>FY 2017 Plans:</b>		0.424	0.440	0.423

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2016	FY 2017	FY 2018
Continue to maintain proper Cybersecurity/Information Assurance (CS/IA) accreditation of any system within the CBDP portfolio throughout its life-cycle. This includes periodic re-accreditation of JPEO CBDP systems.  <b>FY 2018 Plans:</b> Continue to maintain proper Cybersecurity/Information Assurance (CS/IA) accreditation of any system within the CBDP portfolio throughout its life-cycle. This includes periodic re-accreditation of JPEO CBDP systems.			
<b>Accomplishments/Planned Programs Subtotals</b>	7.556	10.357	12.203

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

N/A

**Remarks**

**D. Acquisition Strategy**

BIOSURVEILLANCE PORTAL (BSP)

The Biosurveillance Portal (BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20.

CBRN INFORMATION SYSTEMS

CBRN IS utilizes the agile construct for software requirements management and development. The intent is to scan the programs within the JPEO CBD, DTRA, and other sources for IT assets that can be hosted in a cloud environment and provide a CBRN capability for the warfighter. Once a program has been identified for integration into CBRN IS, an evaluation will occur in order to see if any changes are necessary. Modifications will be completed in coordination with the developer of the capability in order to be in alignment with CBRN IS guidelines.

JOINT EFFECTS MODEL (JEM)

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program	<b>Date:</b> May 2017
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<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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JEM Increment 2 acquisition will utilize the JROC's "IT Box" construct for software development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and fielding products to the service more frequently than an incremental delivery approach.

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

As part of this strategy a single JEM integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in December 2013.

The current contractor for JEM Increment 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The follow-on contract in FY17 will include scope for developing the remaining capabilities under the JEM 2.0 contract. The JEM follow-on contract will utilize full and open competition and will be referred to as the JEM development, modernization and sustainment contract.

An over-arching MS B and Build Decision for RDP-1 were approved by the MDA in Q4 FY14, and a CD1.1 Fielding Decision and a RDP-2 Build Decision were approved in Q3 FY16. Each subsequent RDP will have a single Build Decision and each CD will have an associated Fielding Decision.

**JOINT WARNING & REPORTING NETWORK (JWARN)**

JWARN Increment 2 utilizes the JROC's "IT Box" construct for software requirements management and development. The intent is to provide the next generation of capability with current and future technologies, as stated in the IS ICD, in less time and away from an incremental delivery approach. This effort is being executed under a Cost-Plus-Award Term Incentive structure to gain maximum benefit to the Government in maintaining the fielded baseline and future software capability development and was awarded under a full and open competition Request for Proposal (RFP).

IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Programs conduct a single Milestone B (MSB) decision by the Milestone Decision Authority that covers the entire program. MS B is followed by a series of supporting Build Decisions (BDs) associated with each RDP as they are released. The supporting BDs will ensure incorporation of mature technology and development efforts culminating in incremental deliveries of capability to Joint and Service Command and Control (C2) architectures. Instead of a single Milestone C decision and fielding event for one increment, the program will return to the MDA for more frequent fielding decisions, as often as annually, as portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)</i>	<b>Project (Number/Name)</b> <i>IS7 / INFORMATION SYSTEMS (OP SYS DEV)</i>

The JWARN Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

**SOFTWARE SUPPORT ACTIVITY (SSA)**

The SSA provides enterprise-wide services and coordination across all CBDP programs that contain data or software, or are capable of linking to the Global Information Grid (GIG). The SSA facilitates interoperability, integration, and supportability of existing and developing IT and National Security Systems (NSS). This will be followed by coordination to facilitate the concepts of interoperability, integration and supportability of enterprise-wide services. Next follows work with user communities to develop and demonstrate enterprise-wide common architectures, products and services. The SSA will support the application of the enterprise-wide architectures, products and services into the programs, with verification of compliance with the defined products and services.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - SW S - BSP Modernization	MIPR	Various : Various	0.000	0.000		0.000		0.960	Dec 2017	-		0.960	Continuing	Continuing	0.000
JEM - SW S - Increment 1 - Modernization	C/CPAF	Northrop Grumman Corp. : San Diego, CA	6.972	2.845	Mar 2016	1.953	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
JEM - SW S - Increment 2 - Modernization	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	0.000	0.000		2.828	Apr 2017	4.974	Apr 2018	-		4.974	Continuing	Continuing	0.000
JWARN - SW S - Increment 1 - Modernization	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	9.852	2.408	Mar 2016	0.705	Mar 2017	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - SW S - Increment 2 - Modernization	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	0.000	0.000		2.656	Mar 2017	3.858	Mar 2018	-		3.858	Continuing	Continuing	0.000
SSA - SW S - Development Services	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	2.257	0.460	Nov 2015	0.463	Dec 2016	0.445	Dec 2017	-		0.445	Continuing	Continuing	0.000
<b>Subtotal</b>			19.081	5.713		8.605		10.237		-		10.237	-	-	0.000

<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN IS - ES S - milCloud support	MIPR	Various : Various	0.000	0.000		0.000		0.289	Dec 2017	-		0.289	Continuing	Continuing	0.000
JWARN - ES S - Increment 1 - Modernization	MIPR	Various : Various	0.000	0.424	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
SSA - TD/D C - Information Assurance Activities	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	2.603	0.285	Nov 2015	0.279	Dec 2016	0.268	Dec 2017	-		0.268	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			2.603	0.709		0.279		0.557		-		0.557	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JWARN - OTE S - Increment 1 - FOT&E	MIPR	Various : Various	3.514	0.501	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JWARN - OTE S - Increment 2	MIPR	Various : Various	0.000	0.000		0.403	Nov 2016	0.431	Dec 2017	-		0.431	Continuing	Continuing	0.000
SSA - OTHT S - Integration Verification and Valuation (IV&V)	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	2.418	0.438	Nov 2015	0.464	Dec 2016	0.445	Dec 2017	-		0.445	Continuing	Continuing	0.000
<b>Subtotal</b>			5.932	0.939		0.867		0.876		-		0.876	-	-	0.000

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JWARN - PM/MS S - Program management	MIPR	Various : Various	1.109	0.195	Mar 2016	0.606	Dec 2016	0.533	Dec 2017	-		0.533	Continuing	Continuing	0.000
<b>Subtotal</b>			1.109	0.195		0.606		0.533		-		0.533	-	-	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	28.725	7.556	10.357	12.203	-	12.203	-	-	-

**Remarks**





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**Exhibit R-4, RDT&E Schedule Profile: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SSA - Sustain Common Components products, process and services																												
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface																												
SSA - Provide Configuration Management Services for Common User Products and Services																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSP - Initial Operational Test and Evaluation - RDP 1	2	2016	2	2016
BSP - IOC	3	2016	3	2016
BSP - CSG BD 5	1	2017	1	2017
BSP - CSG BD 6	3	2017	3	2017
BSP - CSG BD 7	1	2018	1	2018
BSP - CSG BD 8	3	2018	3	2018
BSP - CSG BD 9	1	2019	1	2019
BSP - CSG BD 10	3	2019	3	2019
BSP - Final Operational Test and Evaluation - RDP 1	2	2020	2	2020
JEM - Operational Systems Development	1	2016	4	2017
JEM - Service C2 Systems Modernization & Upgrades	1	2016	2	2017
JEM - RDP 2 / Build Decision 2	1	2016	1	2016
JEM - BD 2	3	2016	3	2016
JEM - FD 1	3	2016	3	2016
JEM - RDP 3	2	2016	2	2016
JEM - IOC Standalone	3	2016	3	2016
JEM - BD 3	1	2018	1	2018
JEM - FD 2	3	2017	3	2017
JEM - RDP 4	1	2017	1	2017
JEM - FD 3	4	2017	4	2017
JEM - FD 4	4	2018	4	2018
JEM - Govt DT / OT / V&V	1	2016	4	2020

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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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Events	Start		End	
	Quarter	Year	Quarter	Year
JEM - Modernization and Update	3	2016	4	2021
JEM - BD 4	1	2018	1	2018
JWARN - RDP 1 Approval	1	2016	4	2016
JWARN - RDP 2 Approval	1	2016	1	2016
JWARN - Govt DT / OT / UFEs / OAs / FOTs	1	2016	2	2021
JWARN - RDP 3 Approval	1	2017	1	2017
JWARN - Modernization and Update	3	2016	4	2021
JWARN - RDP 2 Build Decision	3	2016	3	2016
JWARN - RDP 3 Build Decision	1	2017	1	2017
JWARN - Fielding Decision 1	2	2017	2	2017
JWARN - Fielding Decision 2	1	2018	1	2018
JWARN - Fielding Decision 3	1	2019	1	2019
JWARN - IOC RDP 1	3	2017	3	2017
JWARN - IOC RDP 2	2	2018	2	2018
JWARN - IOC RDP 3	2	2020	2	2020
JWARN - RDP 4 Approval	3	2021	3	2021
SSA - Provide Information Assurance Site Compliance Testing	1	2016	4	2022
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2016	4	2022
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2016	4	2022
SSA - Sustain CCSI, including investigation, as an industry standard	1	2016	4	2022
SSA - Sustain Common Components products, process and services	1	2016	4	2022
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2016	4	2022



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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> IS7 / INFORMATION SYSTEMS (OP SYS DEV)
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Events	Start		End	
	Quarter	Year	Quarter	Year
SSA - Provide Configuration Management Services for Common User Products and Services	1	2016	4	2022

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> MB7 / MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MB7: MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)	-	8.541	7.145	11.950	-	11.950	12.836	4.918	1.082	10.623	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This Project provides for the upgrade and modernization of fielded Medical Biological defense equipment/systems including the Joint Biological Agent Identification and Diagnostic System (JBAIDS) and Next Generation Diagnostic Systems (NGDS) suite.

JBAIDS is a commercial off the shelf system that provides a critical capability to identify bacterial and viral agents in environmental surveillance and clinical specimen sample types. By 2005, 16 biological warfare (BW) agent surveillance detection kits were fielded along with the first JBAIDS in vitro diagnostic (IVD) assay cleared by the U.S. Food and Drug Administration (FDA). JBAIDS currently has seven IVD kits cleared by the FDA, JBAIDS achieved full operational capability (340 systems delivered all Services) in July 2011. JBAIDS efforts in FY18 will oversee the configuration management of the system to include the conduct of annual software security information assurance (IA) updates on fielded software, monitoring analyzer/laptop parts obsolescence, and development of pre-emergency use authorization (EUA) packages for FDA review.

The NGDS is an evolutionary acquisition family of systems to provide increments of capability over time across many echelons of the Combat Health Support System. The mission of the NGDS is to provide Chemical, Biological and Radiological (CBR) threat and infectious disease identification and U.S. Food and Drug Administration (FDA) cleared diagnostics to inform individual patient treatment as defined in the approved NGDS Capabilities Development Document (COD) and CBR situational awareness and disease surveillance as defined in the Common Analytical Laboratory (CAL) COD. NGDS Increment 1 will significantly improve diagnostic capability for deployable combat health support units (Role 3) while also improving operational suitability and affordability by developing FDA cleared biological warfare agent (BWA) and infectious disease in vitro diagnostic (IVD) assays on existing commercial diagnostic device with a well established FDA regulatory history and pipeline of commercial non BWA infectious disease diagnostic tests. The NGDS Increment 1 program has a streamlined MS A to MS C Limited Deployment acquisition strategy. BA7 will be used to complete the development of assays initiated during the Technology Maturation and Risk Reduction (TMRR) phase and needed for JBAIDS replacement as well as fund the development of three objective assays (Burkholderia, Alpha Virus, and Orthopox).

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Title:</b> 1) Joint Biological Agent Identification and Diagnostic System (JBAIDS)	0.192	0.200	0.203
<b>FY 2016 Accomplishments:</b> Conducted efforts to ensure Department of Defense Information Assurance Risk Management Framework (DIARMF) and Federal Information Security Management Act (FISMA) compliance.			
<b>FY 2017 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> MB7 / MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continue sustainment contract, software security and RMF FISMA. <b>FY 2018 Plans:</b> Continue sustainment contract, software security and RMF FISMA.				
<b>Title:</b> 2) JBAIDS <b>Description:</b> Continued Pre-EUA package development. <b>FY 2016 Accomplishments:</b> Continued development and submissions of Pre-EUA packages to the FDA. <b>FY 2017 Plans:</b> Continue development and submissions of Pre-EUA packages to the FDA. <b>FY 2018 Plans:</b> Continue development and submissions of Pre-EUA packages to the FDA.		0.130	0.200	0.203
<b>Title:</b> 3) JBAIDS <b>FY 2016 Accomplishments:</b> Maintained the Defense Logistics Agency Electronic-Cataloging capability. <b>FY 2017 Plans:</b> Maintain the Defense Logistics Agency Electronic-Cataloging capability. <b>FY 2018 Plans:</b> Maintain the Defense Logistics Agency Electronic-Cataloging capability.		0.100	0.051	0.052
<b>Title:</b> 4) NGDS - Increment 1 <b>FY 2016 Accomplishments:</b> Continued development of Plague, Tularemia, and Q-Fever IVD assays. <b>FY 2017 Plans:</b> Complete development of Plague, Tularemia, and Q-Fever IVD assays.		8.119	6.694	-
<b>Title:</b> 5) NGDS - Increment 1 <b>FY 2018 Plans:</b>		-	-	11.492

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**Exhibit R-2A, RDT&E Project Justification:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> MB7 / MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Initiate development of additional FDA cleared medical diagnostic assay for the Alphavirus's (Eastern Equine Encephalitis/ Venezuela Equine Encephalitis/Western Equine Encephalitis) and Orthopox (Variola major-Smallpox, Variola minor, Pan-Orthopox, Monkeypox).			
<b>Accomplishments/Planned Programs Subtotals</b>	8.541	7.145	11.950

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

N/A

**Remarks**

**D. Acquisition Strategy**

JOINT BIO AGENT IDENT AND DIAG SYSTEM (JBAIDS)

JBAIDS is a commercial off-the-shelf capability to identify multiple biological agents and other pathogens of operations concern, to include environmental and FDA cleared in vitro diagnostic assays. JBAIDS also has pre-positioned Emergency Use Authorizations assays for the identification of low probability, high consequence pathogens in clinical samples that can be deployed in the event of a declared health emergency. The program plans to conduct the annual JBAIDS Federal Information Security Management Act (FISMA) software compliance certification in addition to any logistics sustainment issues associated with parts obsolescence. The JBAIDS program will begin to prepare for the Risk Management Framework processes for FY16 information assurance. Additionally, the JBAIDS program office continues to partner with the US Army Medical Institute of Infectious Diseases (USAMRIID), other DoD and US Government laboratories to develop FDA Pre-Emergency Use Authorization (EUA) packages for biological warfare agents (BWA's) that could be used as biological warfare threats to DoD military forces.

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

The NGDS Increment 1 program has a streamlined MS A to MS C - Limited Deployment acquisition strategy. The NGDS Increment 1 is intended to replace the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17.

The NGDS Increment 2 program addresses CBRN agents and concepts of employment (COEs) that the NGDS Increment 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBRN agent diagnostics across multiple echelons of care. NGDS Increment 2 will employ a system of systems approach to bridge identified capability gaps for man-portable diagnostics, complementary bench top diagnostics, chemical diagnostics, and handheld disposable diagnostics. NGDS Increment 2 will initiate engineering development of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. Separate decisions will be utilized to establish programs of record for bench top, chemical and handheld disposable diagnostic capability development, based on individual determinations of technology maturity to meet user requirements.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)</i>	<b>Project (Number/Name)</b> MB7 / <i>MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)</i>

<b>E. Performance Metrics</b> N/A
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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Chemical and Biological Defense Program** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> MB7 / MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGDS - Increment 1 - HW C - Assay Development	C/CPFF	BioFire Dx : Salt Lake City, UT	5.969	1.970	Dec 2015	2.391	Dec 2016	4.876	Dec 2017	-		4.876	Continuing	Continuing	0.000
<b>Subtotal</b>			5.969	1.970		2.391		4.876		-		4.876	-	-	0.000

<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGDS - ES S - Engineering Support	MIPR	Various : Various	0.350	0.958	Jan 2016	0.528	Jan 2017	2.527	Jun 2018	-		2.527	Continuing	Continuing	0.000
<b>Subtotal</b>			0.350	0.958		0.528		2.527		-		2.527	-	-	0.000

<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JBAIDS - OTHT S - EUA packages	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.848	0.130	Mar 2016	0.200	Mar 2017	0.203	Mar 2018	-		0.203	Continuing	Continuing	0.000
NGDS - DTE S - Operational Assessment/ MOT&E	MIPR	Various : Various	3.300	1.610	Jan 2016	1.556	Jan 2017	0.372	Jan 2018	-		0.372	Continuing	Continuing	0.000
<b>Subtotal</b>			4.148	1.740		1.756		0.575		-		0.575	-	-	0.000







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**Exhibit R-4A, RDT&E Schedule Details:** FY 2018 Chemical and Biological Defense Program **Date:** May 2017

<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> MB7 / MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JBAIDS - Pre-Emergency Use Authorization Packages	1	2016	4	2020
JBAIDS - Defense Logistics Agency Electronic-Cataloging	1	2016	4	2020
JBAIDS - Contractor Logistics Support, System-Sustainment, Analyzer Refurbishment, FISMA/DIARMF	1	2016	4	2020
JBAIDS - Laptop replacement	1	2016	2	2016
NGDS - Environmental Assay Development	1	2016	2	2017
NGDS - threshold IVD assay development Anthrax, Ebola, Marburg (Plague, Tularemia, Q-Fever)	1	2016	4	2017
NGDS - MS C Increment 1	1	2017	1	2017
NGDS - USAF IOC Increment 1	2	2017	2	2017
NGDS - USAF FOC Increment 1	4	2017	4	2017
NGDS - Objective IVD assay Development (Burkholderia, Alpha Virus, Orthopox)	1	2018	2	2019
NGDS - FRP Increment 1	4	2017	4	2017
NGDS - USA/USN IOC Increment 1	1	2018	1	2018
NGDS - USA/USN FOC Increment 1	2	2019	2	2019
NGDS - MS C Man Portable Device	2	2019	2	2019
NGDS - Follow on Assay Development	4	2018	2	2019
NGDS - Technology Demonstration/Interim Fielding	2	2018	2	2019

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program										<b>Date:</b> May 2017		
<b>Appropriation/Budget Activity</b> 0400 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)				<b>Project (Number/Name)</b> TE7 / TEST & EVALUATION (OP SYS DEV)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TE7: TEST & EVALUATION (OP SYS DEV)	-	2.681	2.594	6.605	-	6.605	6.318	5.416	5.733	5.733	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project provides revitalization of existing instrumentation and technology upgrades to equipment at West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), a Major Range and Test Facility Base (MRTFB), in support of their Chemical and Biological (CB) test mission. Included in these efforts are (1) the Life Sciences Test Facility (LSTF), which is the only U.S. laboratory equipped to test for aerosolized bio-safety level-3 (BSL-3) agents, (2) Major Test Chambers (Materiel Test Facility (MTF) and Building 4165) at WDTC, (3) the CB Test Grid at WDTC, and (4) the Combined Chemical Test Facility (CCTF) at WDTC.

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

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Title:</b> 1) BTB UPGRADE</p> <p><b>Description:</b> BTB Test LSTF Complex</p> <p><b>FY 2018 Plans:</b> Continues to provide instrumentation and equipment to BTB-ECBC, in support of the CB Defense mission. Continues to provide for BSL-3 biological laboratory equipment for the LSTF Annex. Provides for enhancement of the biological decontamination capability. Provides for enhanced laboratory referee capability and management.</p>	-	-	0.925
<p><b>Title:</b> 2) BTB/ECBC - MRTFB - Life Sciences Test Facility (LSTF)</p> <p><b>FY 2016 Accomplishments:</b> Continued to provide instrumentation and equipment to BTB-ECBC, in support of the CB Defense mission. Continued to provide for BSL-3 biological laboratory equipment for the LSTF Annex. Also provided for enhanced laboratory referee capability and enhancement of the biological decontamination capability.</p> <p><b>FY 2017 Plans:</b> Will continue to provide instrumentation and equipment to BTB-ECBC, in support of the CB Defense mission. Will continue to provide for BSL-3 biological laboratory equipment for the LSTF Annex. Will provide for enhancement of the biological decontamination capability. Will also provide for enhanced laboratory referee capability and management.</p>	0.816	0.509	-
<p><b>Title:</b> 3) WDTC - MRTFB - Major Test Chambers (MTF and Building 4165)</p> <p><b>FY 2016 Accomplishments:</b> Provided for modernization of existing instrumentation and equipment in the major test chambers at WDTC, in support of the CB Defense mission. These chambers consist of the following: (1) the MTF, which is a unique test chamber in which agent</p>	0.348	0.160	1.220

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> TE7 / TEST & EVALUATION (OP SYS DEV)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p>operation can be conducted on a large scale under environmental controls; (2) Building 4165, which houses updated surety test facilities and laboratories used for the testing of protective material, decontamination technologies, and detection systems with chemical agents and simulants; Modernization in the chambers included: (a) Continued enhancements of an aerosol generation and sampling capability; (b) Continued development of the agent fate aerosol capability; (c) Continued upgrades to agent surety monitor and analytical instrumentation; (d) Continued enhancements of Toxic Industrial Chemical (TIC) detection; and (e) Non-Traditional Agent (NTA) test and detection capability.</p> <p><b>FY 2017 Plans:</b> Modernization in the chambers will include: (a) Continued enhancements of an aerosol generation and sampling capability; (b) Additional upgrades to agent surety monitor and analytical instrumentation; (c) Continued enhancement of TIC detection; and (d) expanded NTA test and detection capability.</p> <p><b>FY 2018 Plans:</b> Modernization in the chambers will include: (a) Continued enhancements of an aerosol generation and sampling capability; (b) Additional upgrades to agent surety monitor and analytical instrumentation; (c) Continued enhancement of TIC detection; and (d) expanded NTA test and detection capability.</p>			
<p><b>Title:</b> 4) WDTC - MRTFB - CB Test Grid</p> <p><b>FY 2016 Accomplishments:</b> Enhanced existing instrumentation and equipment at multiple test grids (Target S, Downwind, Tower Outdoor Test Grids, etc.) at WDTC, in support of the CB Defense mission. DPG's vast area combined with its remote location allowed for all sizes of CB and explosive test events, including large scale TIC release capability, and was supported by a state of the art meteorological and referee capability. Continued modernization efforts included: (1) Continued upgrades to point and standoff field referee systems; (2) Development of agent to simulant correlation, dissemination equipment, and monitoring systems for additional field simulants; (3) Upgrade of grid communications and data analysis capabilities; (4) Enhanced aerosol dissemination systems; (5) Upgraded high speed cameras. Enhancements to Test Grid provided near real time data analysis and rapid test adaptation which minimized costs and increased the effectiveness of field testing.</p> <p><b>FY 2017 Plans:</b> Continuing modernization efforts will include: (1) Enhancement of point and standoff field referee systems; (2) Upgrade of grid communications and data analysis capabilities; (3) Additional upgrades to enhance optic data collection. Enhancements to Test Grid will provide near real time data analysis and rapid test adaptation to minimize costs and increase the effectiveness of field testing.</p> <p><b>FY 2018 Plans:</b></p>	0.415	1.051	1.384

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> TE7 / TEST & EVALUATION (OP SYS DEV)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
Continuing modernization efforts will include: (1) Enhancement of point and standoff field referee systems; (2) Upgrade of grid communications and data analysis capabilities; (3) Additional upgrades to enhance optic data collection. Enhancements to Test Grid will provide near real time data analysis and rapid test adaptation to minimize costs and increase the effectiveness of field testing.			
<b>Title:</b> 5) WDTC - MRTFB - Combined Chemical Test Facility (CCTF) <b>FY 2016 Accomplishments:</b> Provided for continued revitalization and upgrade of existing instrumentation and equipment at the CCTF at WDTC in support of their chemical test mission. The CCTF tests the capability of detectors, decontaminants, and protective systems to defend against toxic chemical agents. Modernization resulted in improved test fixtures which reduced risk to personnel and provided improved test capabilities. <b>FY 2017 Plans:</b> Will provide for continued revitalization and upgrade of existing instrumentation and equipment at the CCTF at WDTC in support of their chemical test mission. Upgrade of chemical laboratory fume hoods will start in FY17. Modernization will continue to improve test fixtures which will reduce risk to personnel and provide improved test capabilities. Will continue efforts to enhance NTA test capability in these fixtures. <b>FY 2018 Plans:</b> Will provide for continued revitalization and upgrade of existing instrumentation and equipment at the CCTF at WDTC in support of their chemical test mission. Upgrade of chemical laboratory fume hoods will continue in FY18. Modernization will result in improved test fixtures which will reduce risk to personnel and provide improved test capabilities. Will continue efforts to enhance NTA test capability in these fixtures.	1.102	0.874	3.076
<b>Accomplishments/Planned Programs Subtotals</b>	2.681	2.594	6.605

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

N/A

**Remarks**

**D. Acquisition Strategy**

BIO TEST BRANCH T&E UPGRADE (BTB UPGRADE)

Test and evaluation Range Instrumentation/Technology Upgrades is a continuing project. It provides for technical upgrades to Bio Test Branch (ECBC) capabilities for Biological testing of DoD CB materiel, weapons, and weapons systems from concept through production. Technical and Facility upgrades will utilize full and open competition as appropriate through ECBC contract resources.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> FY 2018 Chemical and Biological Defense Program		<b>Date:</b> May 2017
<b>Appropriation/Budget Activity</b> 0400 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	<b>Project (Number/Name)</b> TE7 / TEST & EVALUATION (OP SYS DEV)

T&E RANGE INSTRUMENT/TECH UPGRADE (T&E UPGRADE)

Test and evaluation Range Instrumentation/Technology Upgrades is a continuing project. It provides for technical upgrades to WDTC capabilities for Chemical and Biological testing of DoD CB materiel, weapons, and weapons systems from concept through production.

**E. Performance Metrics**

N/A

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